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Department
of Transportation
National Highway
Traffic Safety
Administration

DOT HS 807 240

January 1988

Test Report

Vehicle Barrier Impact Testing with Hybrid III Dummies in a 1987 Ford Escort 5-Door Hatchback



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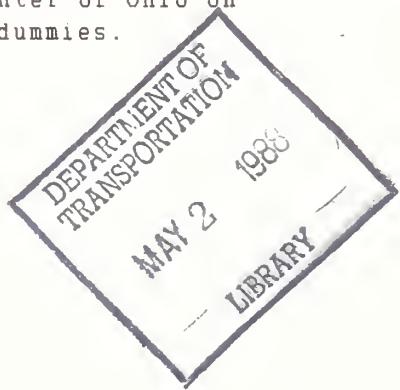
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7. Author(s) J.W. Sankey, Project Engineer. TRC		10. Work Unit No. (TRAIS)	
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16. Abstract A 30 mph flat frontal barrier impact test was conducted on a 1987 Ford Escort 5-door hatchback at the Transportation Research Center of Ohio on December 16, 1987, using Hybrid III driver and passenger dummies. The barrier impact velocity was 29.5 mph. The ambient temperature was 62°F.			
			
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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

This 30 mph frontal barrier impact test is part of a program to document the response of Hybrid III occupant dummies conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center of Ohio (TRC) under Contract No. DTNH22-85-C-08123. The purpose of this test was to determine Hybrid III dummy response in the subject vehicle, a 1987 Ford Escort 5-door hatchback. The test was conducted in accordance with the FMVSS 208 portions of the Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-06 dated May 15, 1987, except for the use of Hybrid III dummies in place of Part 572 P dummies.

TEST SUMMARY

The 1987 Ford Escort 5-door hatchback was equipped with a 1.6 liter transverse engine, manual transmission, and power brakes. The test weight of the vehicle was 2822 pounds. The Head Injury Criteria (HIC) calculations were less than 1000, the resultant accelerations of the thorax did not exceed 60 g's, and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Hybrid III dummies seated in the driver's and right front passenger's seats.

Two Hybrid III, 50th percentile, adult male anthropomorphic test devices (ATDs) were seated in the front outboard designated seating positions. The dummies were positioned according to the dummy placement procedures specified in FMVSS 208 Notice 45.

Both ATDs were instrumented with head and chest triaxial accelerometers oriented to measure accelerations in the longitudinal, lateral, and vertical directions, a chest displacement potentiometer, right and left femur load cells, and neck load cells oriented to measure longitudinal and vertical forces and moment about the lateral axis.

The vehicle was instrumented with seven longitudinal axis accelerometers. Seat belt load cells were installed on each occupant's passive seatbelt.

The crash event was recorded by one (1) real time panning camera and fourteen (14) high speed motion picture cameras operating at approximately 500 frames per second.

The thirty-three (33) channels of data were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 8000 samples per second digitally processed per sections 12.8 and 12.9 of the laboratory procedure.

The vehicle was impacted into the rigid, flat frontal barrier at the Transportation Research Center of Ohio on December 16, 1987. The test vehicle's impact speed was 29.5 mph. The vehicle sustained 19.1 inches of static crush.

The camera information is presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the vehicle and dummy data plots. Appendix C contains the pre-test and post-test dummy performance calibrations.

CRASH TEST SUMMARY

TEST NO.: 871216

DATE: December 16, 1987

TIME: 1338 TEMP: 62°F

VEHICLE: 1987 Ford Escort 5-door Hatchback

TEST WEIGHT (LBS): 2822

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.5 SECONDARY = 29.4

MAX CRUSH (IN) STATIC: 19.1

REBOUND (IN): 24.8

DUMMIES: Driver Passenger

TYPE: Hybrid III Hybrid III

LOCATION: Front Left Front Right

RESTRAINT: Two-point passive belt Two-point passive belt

NUMBER OF DATA CHANNELS: 33

NUMBER OF HIGH SPEED CAMERAS: 14 and 1 real-time camera

*With respect to tow track centerline.

**Speed trap measurement ($\pm .05$ mph accuracy).

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company

MAKE/MODEL: Ford Escort

VIN: 1FAPP2598HT183919

BODY STYLE: 5-door hatchback

MODEL YEAR: 1987

COLOR: Black

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 1.6 liter

Gas, DIESEL, TURBOCHARGE

TRANSMISSION DATA: 4 SPEED, MANUAL, AUTOMATIC, FWD RWD

DATA VEHICLE RECEIVED: 12/8/87

ODOMETER READING: 151

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING No

AUTOMATIC TRANSMISSION No

POWER BRAKES Yes

AUTOMATIC SPEED CONTROL No

POWER SEATS No

TLTING STEERING WHEEL No

POWER WINDOWS No

TELESCOPING STEERING WHEEL No

TINTED GLASS Yes

AIR CONDITIONING No

RADIO No

ANTI-SKID BRAKE No

CLOCK Yes

REAR WINDOW DEFROSTER Yes

OTHER None

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Ford Motor Company

DATE OF MANUFACTURE: 6/87

GVWR: 3165 LBS.

GAWR: FRONT 1811 LBS., REAR 1547 LBS.

TEST VEHICLE INFORMATION, CONTINUED

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: P165/80R13 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Goodyear Corsa GT P165/80R13

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

VEHICLE CAPACITY: TYPES OF SEATS: Front bucket
Rear bench

TYPE OF FRONT SEAT BACKS Manual Adjustable

NUMBER OF OCCUPANTS 2 FRONT 2 REAR 4 TOTAL

CARGO LOAD 150 LBS. TOTAL 750 LBS.

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT 706 lbs. RIGHT REAR 455 lbs.

LEFT FRONT 732 lbs. LEFT REAR 458 lbs.

TOTAL FRONT WEIGHT 1,438 lbs. (61.2% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 913 lbs. (38.8% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2,351 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW + RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2351 LBS)

VCW = VEHICLE CAPACITY WEIGHT (750 LBS)

DSC = DESIGNATED SEATING CAPACITY (4)

RCLW = VCW - (150) (DCS) = (150 LBS)

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 167 LBS/DUMMY)

= 2351 + 150 + 334 LBS

TARGET TEST WEIGHT = 2835 LBS

TEST VEHICLE INFORMATION, CONTINUED

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 137 LBS. CARGO:

RIGHT FRONT 749 lbs. **RIGHT REAR** 626 lbs.

LEFT FRONT 790 lbs. **LEFT REAR** 657 lbs.

TOTAL FRONT WEIGHT 1,539 lbs. (54.5% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1,283 lbs. (45.5% OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 2,822 lbs. (0.5% UNDER TARGET WEIGHT)

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 lbs.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES): NONE

DELIVERED ATTITUDE: LF 26.2; RF 26.8; LR 25.4; RR 25.2

PRE-TEST ATTITUDE: LF 25.7; RF 26.4; LR 23.2; RR 23.3

POST-TEST ATTITUDE: LF 27.9; RF 30.0; LR 22.6; RR 22.8

WHEELBASE: 93.8 INCHES

MAX. WIDTH: 64.2 INCHES

CG = 42.6 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TEST VEHICLE INFORMATION, CONTINUED

TEST CONDITIONS

TEST NUMBER: 871216

DATE OF TEST: 12/16/87

TIME OF TEST: 1338

TYPE OF TEST: Frontal Barrier Impact

IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA:

62 °F

TEMPERATURE IN OCCUPANT COMPARTMENT:

30 °F

DRIVER TEMPERATURE:

70 °F

PASSENGER TEMPERATURE:

70 °F

IMPACT VELOCITY: PRIMARY = 29.5 MPH

SECONDARY = 29.4 MPH

(SPECIFIED RANGE = 28.9 to 29.9 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

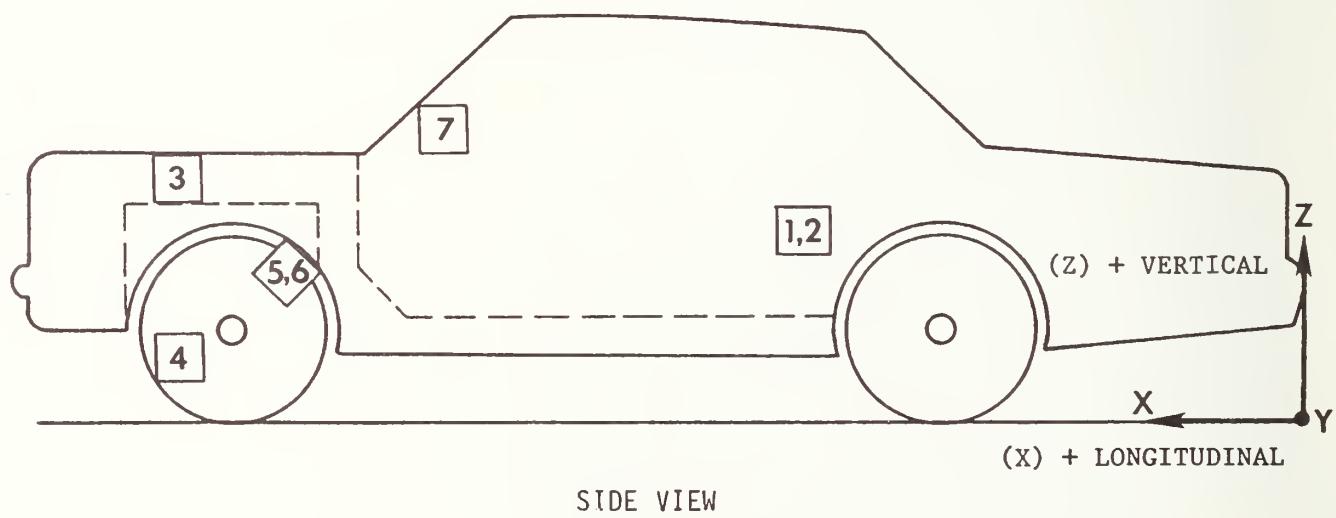
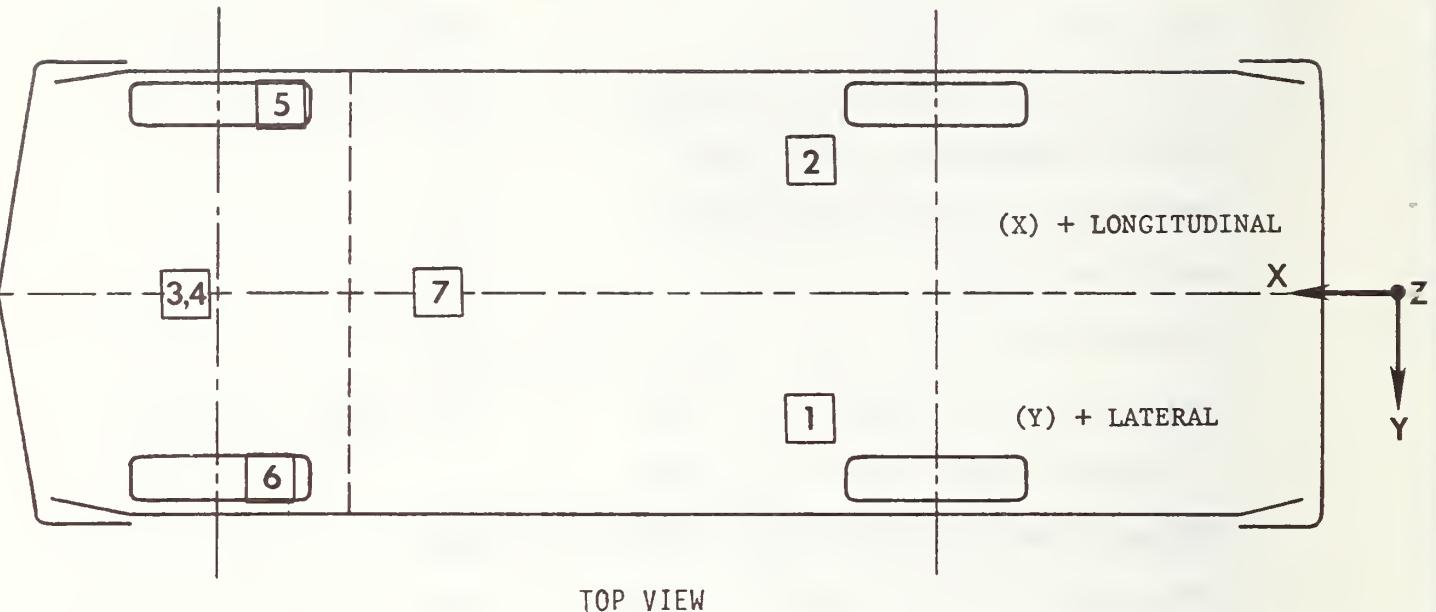
OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 165.1 : C 168.8 : R 166.0

POST-TEST: L 142.4 : C 149.2 : R 149.6

TOTAL CRUSH: L 12.2 : C 19.1 : R 16.4

FOR FRONTAL IMPACT, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: L: 25.2 : C: 24.8 : R: 24.4 : AVG: 24.8

VEHICLE ACCELEROMETER LOCATIONS



TEST NUMBER 871216

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

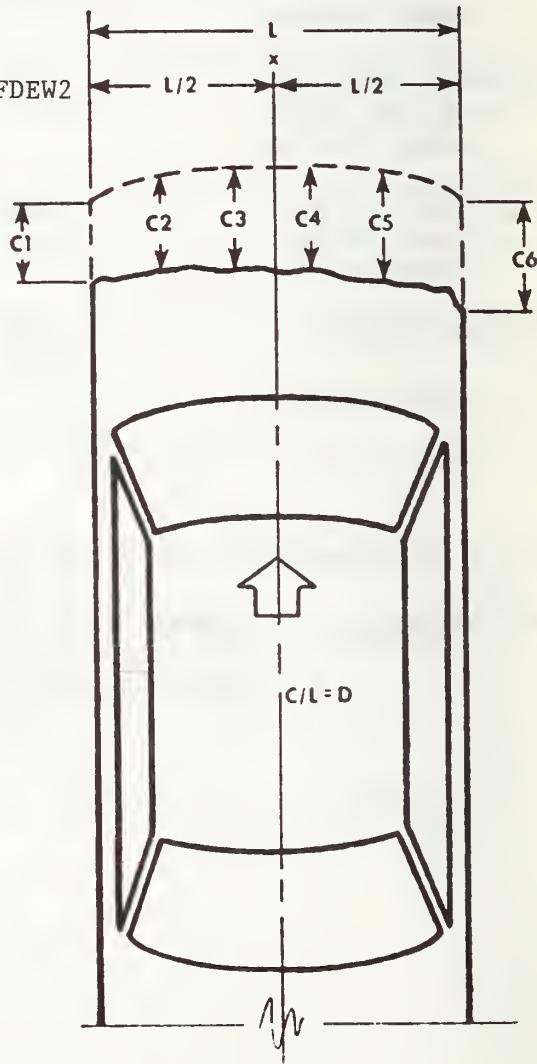
No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
						MAX G	MSEC	MAX G	MSEC
1	REAR SEAT CROSMEMBER AT LEFT SIDE LONGITUDINAL	PRE POST	63.8 63.8	20.8 20.8	12.2 12.5			1.3	114.4
								27.5	50.5
2	REAR SEAT CROSMEMBER AT RIGHT SIDE LONGITUDINAL	PRE POST	63.6 63.6	-21.8 -21.8	12.2 12.6			1.7	135.0
								26.9	54.8
3	TOP OF ENGINE BLOCK LONGITUDINAL	PRE POST	139.1 136.3	0.0 0.5	31.4 30.0			18.7	58.5
								89.9	38.0
4	BOTTOM OF ENGINE LONGITUDINAL	PRE POST	139.3 135.9	5.2 4.4	8.5 6.9			24.6	53.0
								82.8	33.3
5	BRAKE CALIPER AT RIGHT SIDE LONGITUDINAL	PRE POST	135.8 132.2	-25.8 -26.5	8.0 7.6			25.6	50.3
								71.2	29.0
6	BRAKE CALIPER AT LEFT SIDE LONGITUDINAL	PRE POST	135.9 132.4	25.8 28.2	8.5 7.4			32.2	53.3
								73.5	34.4
7	DASH PANEL LONGITUDINAL	PRE POST	105.5 105.2	-1.0 -1.0	36.4 37.4			10.1	113.8
								65.9	80.4

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

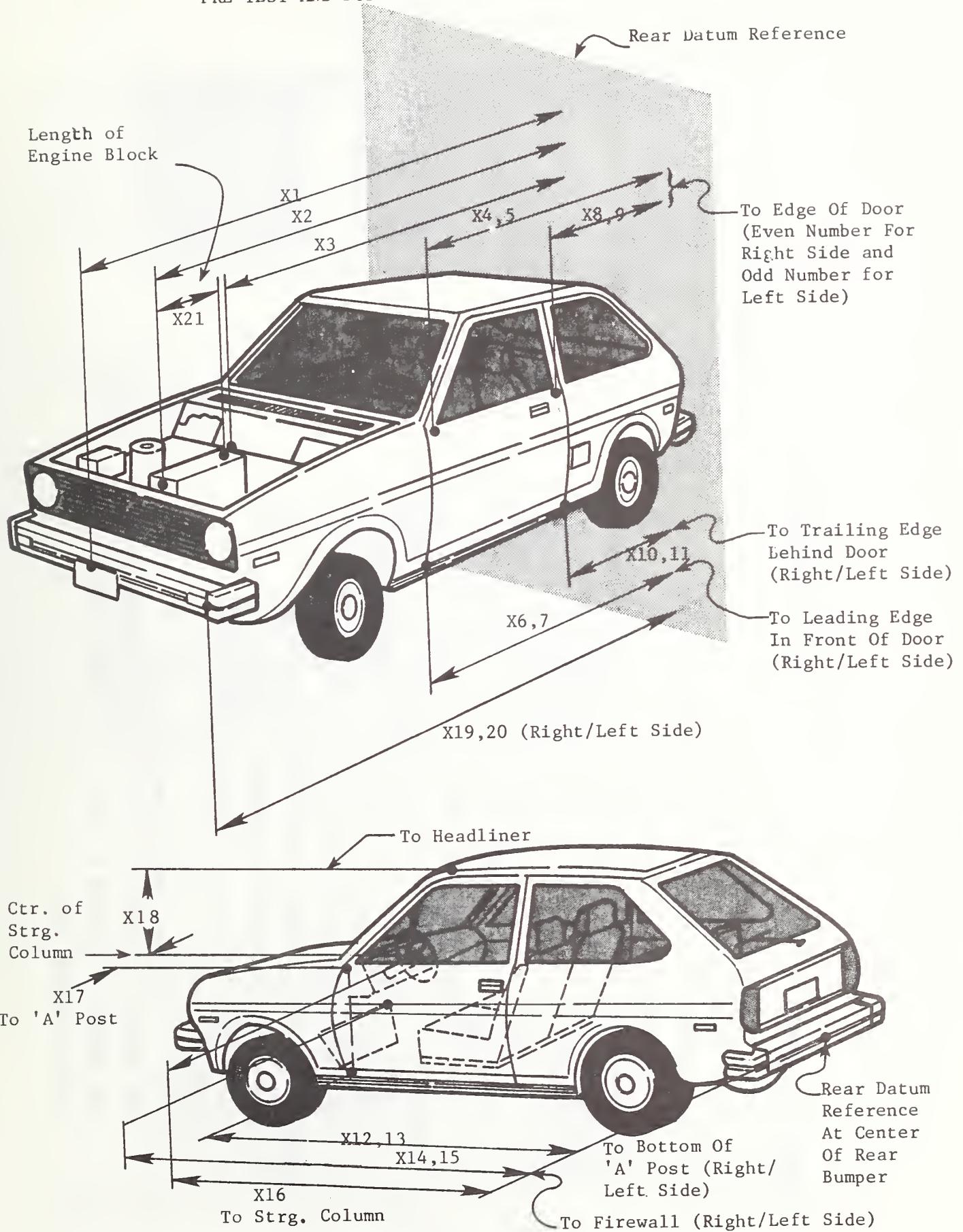
REFERENCE: X: FORWARD FROM REAR BUMPER
 Y: LEFT FROM VEHICLE CENTERLINE
 Z: UPWARD FROM GROUND LEVEL

ACCIDENT INVESTIGATION DIVISION DATA

FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Ford Escort 5-door HatchbackVEH. NHTSA NO.: _____; VIN: 1FAPP2598HT183919MODEL YEAR: 1987; BUILD DATE: 6/87; TEST DATE 12/16/87VEH. SIZE CATEGORY: Compact; TEST WEIGHT: 2822VEH. WHEELBASE: 93.8 FRONT OVERHAND: 35.9 MAX. WIDTH: 64.2COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: 12FDEW2F (Frontal)CRUSH DEPTH DIMENSIONS: C1 = 17.7 inchesC2 = 17.9 inchesC3 = 18.3 inchesC4 = 18.5 inchesC5 = 17.9 inchesC6 = 16.4 inchesMIDPOINT OF DAMAGE: D = (Longitudinal)LENGTH OF DAMAGED REGION: L = 56.2 inches

PRE-TEST AND POST-TEST MEASUREMENT POINTS

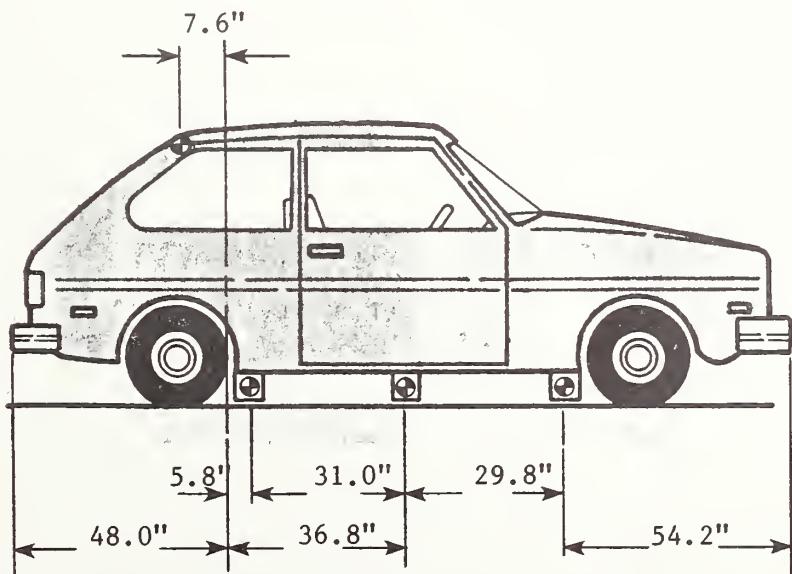
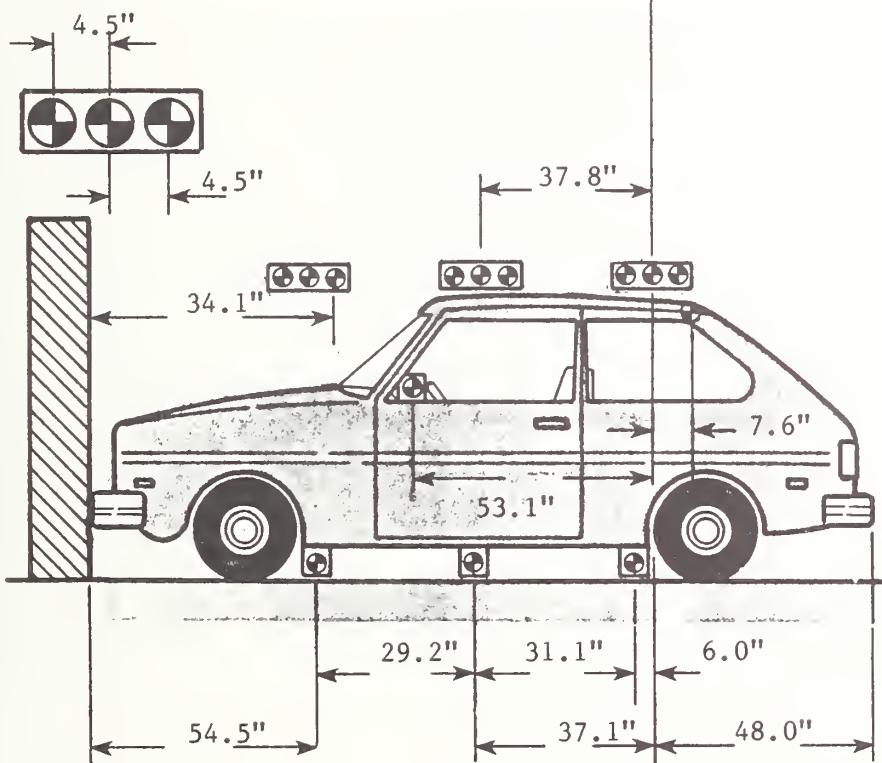
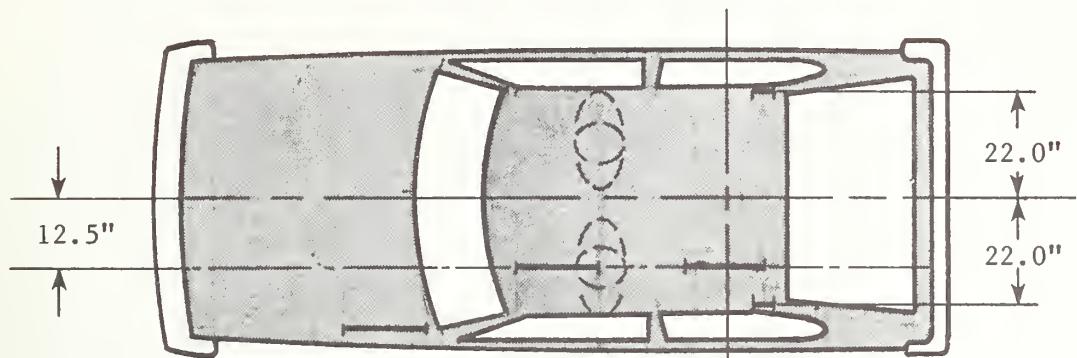


VEHICLE MAKE/MODEL Ford/EscortIMPACTED VEHICLE MEASUREMENTS

TEST NUMBER 871216

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES		
		PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	168.8	149.7	19.1
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	143.4	139.9	3.5
X3	REAR SURFACE OF VEHICLE TO FIREWALL	125.7	123.7	2.0
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	110.1	110.1	0.0
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	110.1	109.9	0.2
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	110.3	110.5	-0.2
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	110.3	110.0	0.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	73.5	73.3	0.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	73.5	73.2	0.3
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	73.0	73.0	0.0
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	72.8	73.0	-0.2
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	109.1	108.9	0.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	108.9	108.9	0.0
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	125.4	122.1	3.3
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	124.2	124.8	-0.6
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	94.6	95.2	-0.6
X17	CENTER OF STEERING COLUMN TO "A" POST	13.2	13.1	0.1
X18	CENTER OF STEERING COLUMN TO HEADLINING	16.5	17.2	-0.7
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	166.0	149.6	16.4
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	165.1	147.4	17.7
X21	LENGTH OF ENGINE BLOCK	17.2	17.2	0.0

VEHICLE TARGET LOCATIONS





SECTION 2.0

SUMMARY OF TEST RESULTS

DATA SUMMARY

The driver's Head Injury Criteria, HIC, was 830. The driver's maximum chest deceleration over three milliseconds was 41.7 g. The driver's right and left compressive femur loads were 807.8 pounds and 872.1 pounds, respectively. The driver's maximum chest displacement was 1.7 inches.

The right front passenger's Head Injury Criteria, HIC, was 611. The right front passenger's maximum chest deceleration over three milliseconds was 35.3 g. The right front passenger's right and left compressive femur loads were 976.5 pounds and 654.5 pounds, respectively. The right front passenger's maximum chest displacement was 2.2 inches.

The vehicle's restraint system met the comfort and convenience requirements of FMVSS 208.

DUMMY DATA SUMMARY

DRIVER DUMMY				PASSENGER DUMMY				
SN: 45		SN: 143						
POSITIVE DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**		
MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME	
HEAD ACCELERATION (g)								
LONGITUDINAL	28.8	185.6	83.4	82.4	86.0	173.8	44.3	97.4
LATERAL	5.4	80.8	12.0	91.6	6.6	173.2	6.0	226.9
VERTICAL	2.8	307.8	64.6	74.9	3.3	8.0	50.7	79.4
RESULTANT	103.1	75.0			89.3	173.8		
HIC	830 from 65.0 to 91.9 msec				611 from 66.4 to 102.4 msec			
NECK LOADS (lbs)								
SHEAR (X)	320.9	78.9	35.8	199.8	333.0	98.0	33.5	180.2
AXIAL (Z)	442.0	82.0	21.7	108.9	478.0	83.2	7.5	17.5
NECK MOMENTS (lb-ft)								
ABOUT LATERAL	22.2	100.1	20.9	56.2	61.3	93.2	19.1	224.8
CHEST ACCELERATION (g)								
LONGITUDINAL	4.3	130.9	42.3	67.2	4.3	240.6	38.7	74.2
LATERAL	3.6	53.1	6.2	79.4	3.6	53.8	7.1	89.5
VERTICAL	5.1	68.2	4.6	86.9	13.2	91.1	4.4	187.4
RESULTANT	42.8	67.2			39.6	74.2		
3 MSEC CLIP	41.7				35.3			
CHEST DISPLACEMENT (in)								
	1.7	86.1	0.0	25.5	2.2	86.5	0.0	0.0
FEMUR LOADS (lbs)								
LEFT	73.9	117.6	872.1	57.1	47.5	334.5	654.5	83.8
RIGHT	89.6	129.0	807.8	40.2	23.8	326.1	976.5	71.8

*LONGITUDINAL: FORWARD
 LATERAL: LEFTWARD
 VERTICAL: UPWARD
 DISPLACEMENT: INWARD
 FORCE: TENSION

**LONGITUDINAL: REARWARD
 LATERAL: RIGHTWARD
 VERTICAL: DOWNWARD
 DISPLACEMENT: OUTWARD
 FORCE: COMPRESSION

SEAT BELT DATA SUMMARY

SEAT BELT TENSION

<u>LOCATION</u>	<u>MAX. LBS.</u>	<u>TIME, MSEC.</u>
DRIVER'S PASSIVE BELT	1945.1	77.9
RIGHT FRONT PASSENGER'S PASSIVE BELT	1946.2	82.6

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward impacting the steering wheel as the dummy's chest was restrained by the two-point passive seat belt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seatback. The dummy came to rest seated upright in the driver's seat restrained by the two-point passive seat belt.

PASSENGER DUMMY

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward as the dummy's chest was restrained by the two-point passive seat belt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seatback. The dummy came to rest seated upright in the passenger's seat restrained by the two-point passive seat belt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER
Head	<u>Steering wheel rim and hub</u>	<u>None</u>
Chest	<u>None</u>	<u>None</u>
Abdomen	<u>None</u>	<u>None</u>
Left Knee	<u>Instrument panel</u>	<u>Instrument panel</u>
Right Knee	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Easy</u>	<u>Difficult, no tools required</u>
Rear	<u>Easy</u>	<u>Easy</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>None</u>
Rear	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

Three cracks on left side of windshield.

OTHER NOTABLE IMPACT EFFECTS:

None

DUMMY POSITIONING DATA FOR
30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

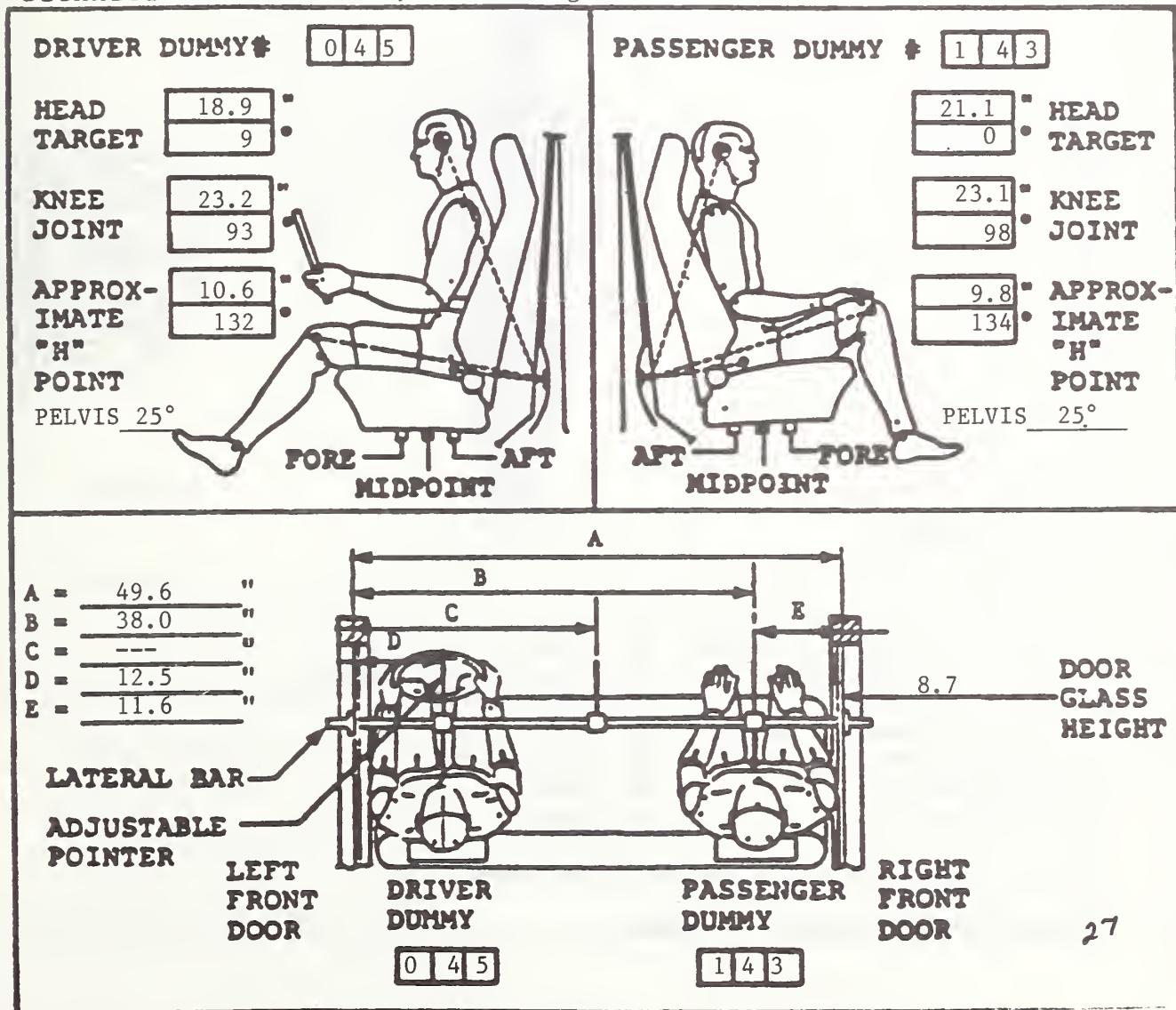
Make/Model: Ford Escort **Body Style:** 5-door Hatchback **Model Year:** 1987
NHTSA No.: _____ **Color:** Black

DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Ford Motor Company
Date of Manufacture: 6/87; **VIN:** 1FAPP2598HT183919
GVWR: 3165 lb; **GAWR:** Front = 1811 lb; Rear = 1547 lb

POST-IMPACT DATA:

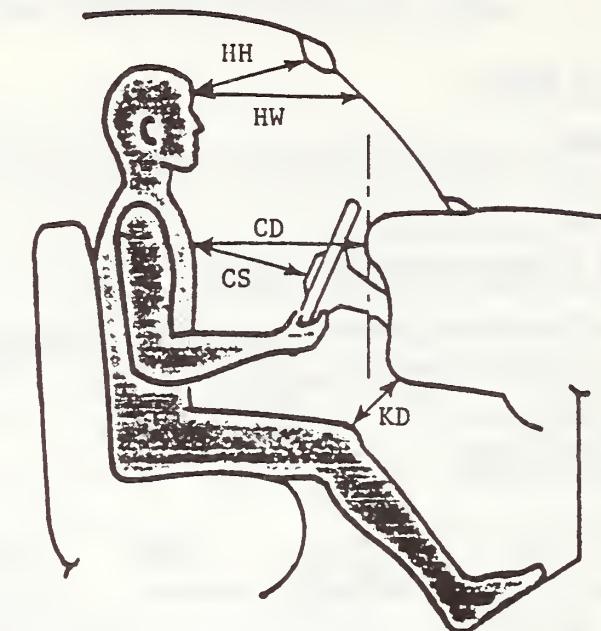
Date of Test: 12/16/87 Time: 1040 Temperature 71 °F
Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 29.5 mph Secondary = 29.4 mph
Seat Type: Bucket Adjuster Type: Manual
Bucket Seat Back Type: Adjustable
Technicians: B. Miller, B. Fishbaugh



DUMMY IN-VEHICLE POSITION RECORDING SHEET

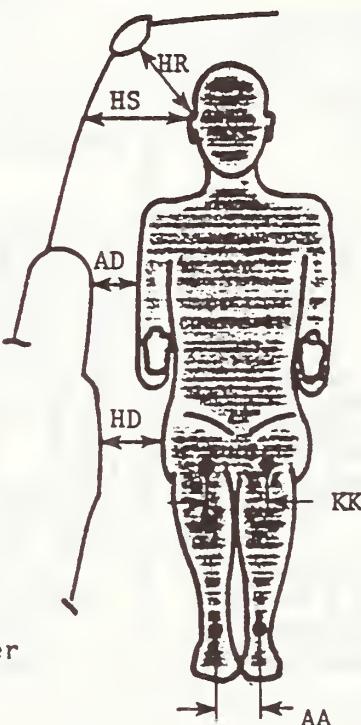
DRIVER PASSENGER
045 143

HH	12.2	13.8
HW	17.8	18.9
CD	18.6	20.1
CS	11.5	---
KDL	2.1	3.2
KDR	2.1	3.1
TA	17°	18°
SA	30°	30°
HA	9.8	11.1



DRIVER PASSENGER
045 143

HR	6.9	5.4
HS	9.5	9.4
AD	3.1	3.6
HD	5.4	4.3
KK	8.0	7.9
AA	9.2	6.4



A-PILLAR

Knee outer bolt head to outer
bolt head spacing:

Driver = 10.6
Passenger = 10.6

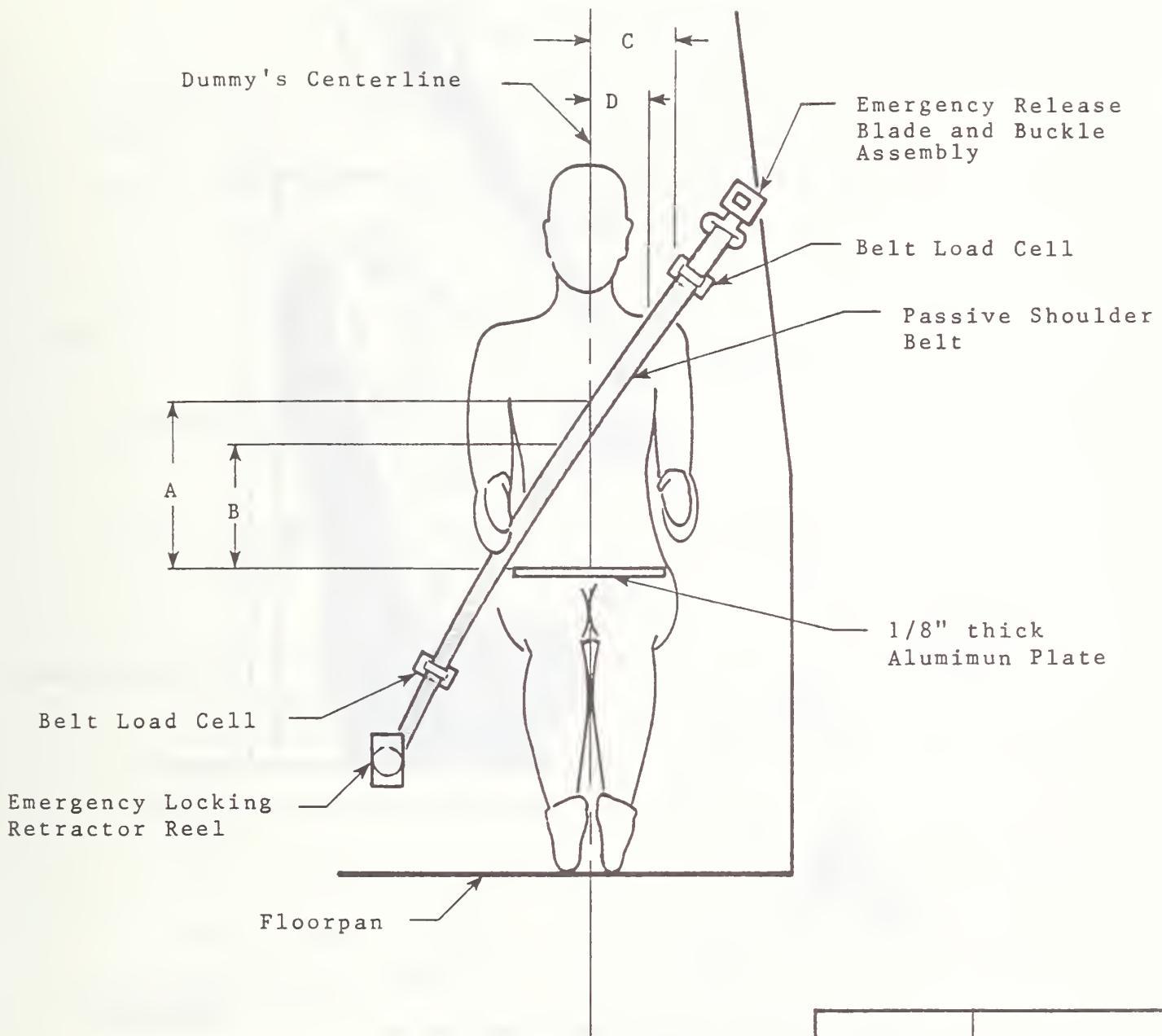
HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD = Knee to Dash
TA = Torso Angle
SA = Seat Back Angle

HR = Head to Side Roof
HS = Head to Side Window
AD = Arm to Door
HD = Hip to Door
KK = Knee to Knee
AA = Ankle to Ankle
HA = Head to A Pillar

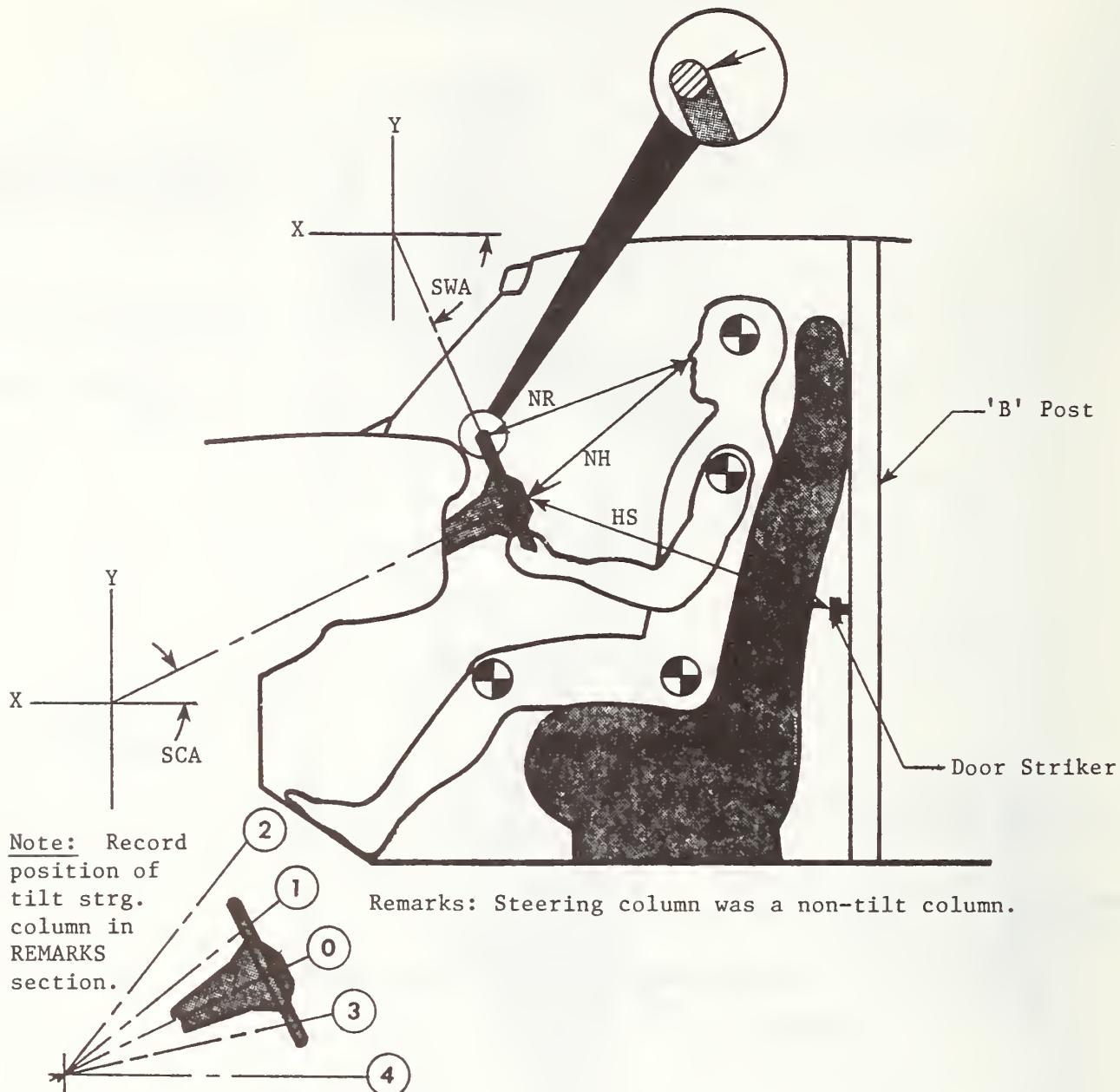
Torso and seat back angles are relative to vertical.

ALL DISTANCE MEASUREMENTS IN INCHES

SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	13.0	13.9
B - Top surface of alum. plate to belt lower edge (in)	10.3	10.5
C - Dummy centerline to outer edge of belt at chest flesh top (in)	4.6	5.4
D - Dummy centerline to inner edge of belt at chest flesh top (in)	1.3	2.8
SHOULDER BELT TENSION (lbs)	NA	NA

MEASUREMENTS

NR - Distance from tip of dummy's nose to top rear surface of steering wheel rim.

14.1

NH - Distance from tip of dummy's nose to center of steering column hub.

14.6

HS - Distance from center of steering column hub to the forward surface of the door lock striker pin.

19.8

SCA - Angle of steering column relative to the horizontal X axis.

26°

SWA - Angle of steering wheel relative to the horizontal X axis.

64°

FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN NO.: 1FAPP2598HT183919

MAKE: Ford MODEL: Escort

VEHICLE BUILD DATE: 6/87 VEHICLE TYPE 5 door hatchback

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): X Automatic belts

 Type 2 lap/shoulder belts

 Other

CONVENIENCE HOOKS: NA, vehicle's restraint system did not include convenience hooks.

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION BELTS HAVE TENSION - RELIEVING DEVICES?

No

MAXIMUM SLACK RECOMMENDED IN OWNERS MANUAL: NA INCHES

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT?

NA

IF NO, EXPLAIN

AUTOMATIC BELTS: IS TENSION - RELIEVING DEVICE CANCELLED EACH TIME THE ADJACENT DOOR IS OPENED? NA

IF NO, EXPLAIN:

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:

0.4 POUNDS

LATCHPLATE ACCESS: NA

RETRACTION: NA

ACCESSIBILITY: NA

LATCH MECHANISM: NA

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN STOWED POSITION AND IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 6 sec.

Duration of reminder light operation = 6 sec.

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN USE AND THE IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal - 0 sec.

(Note: audible warning should not operate)

Duration of reminder light operation = 6 sec.

Wording of visual warning:

Fasten Seat Belt _____

Fasten Belt _____

Symbol 101-80 X

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER's MAINTENANCE OR
REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM: NA,
vehicle did not contain a crash-deployed occupant protection system.

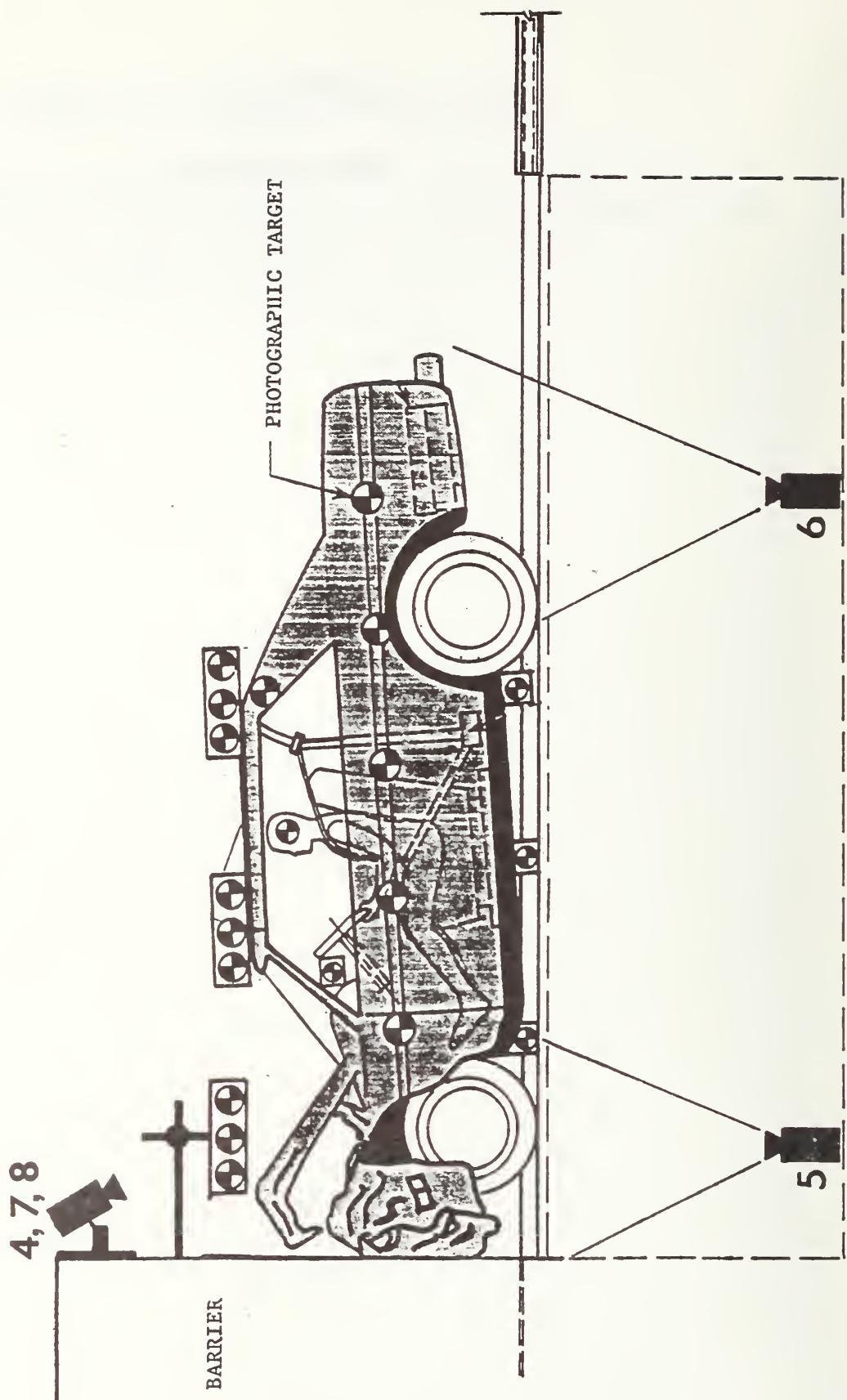
FMVSS NO. 208 - READINESS INDICATOR DATA

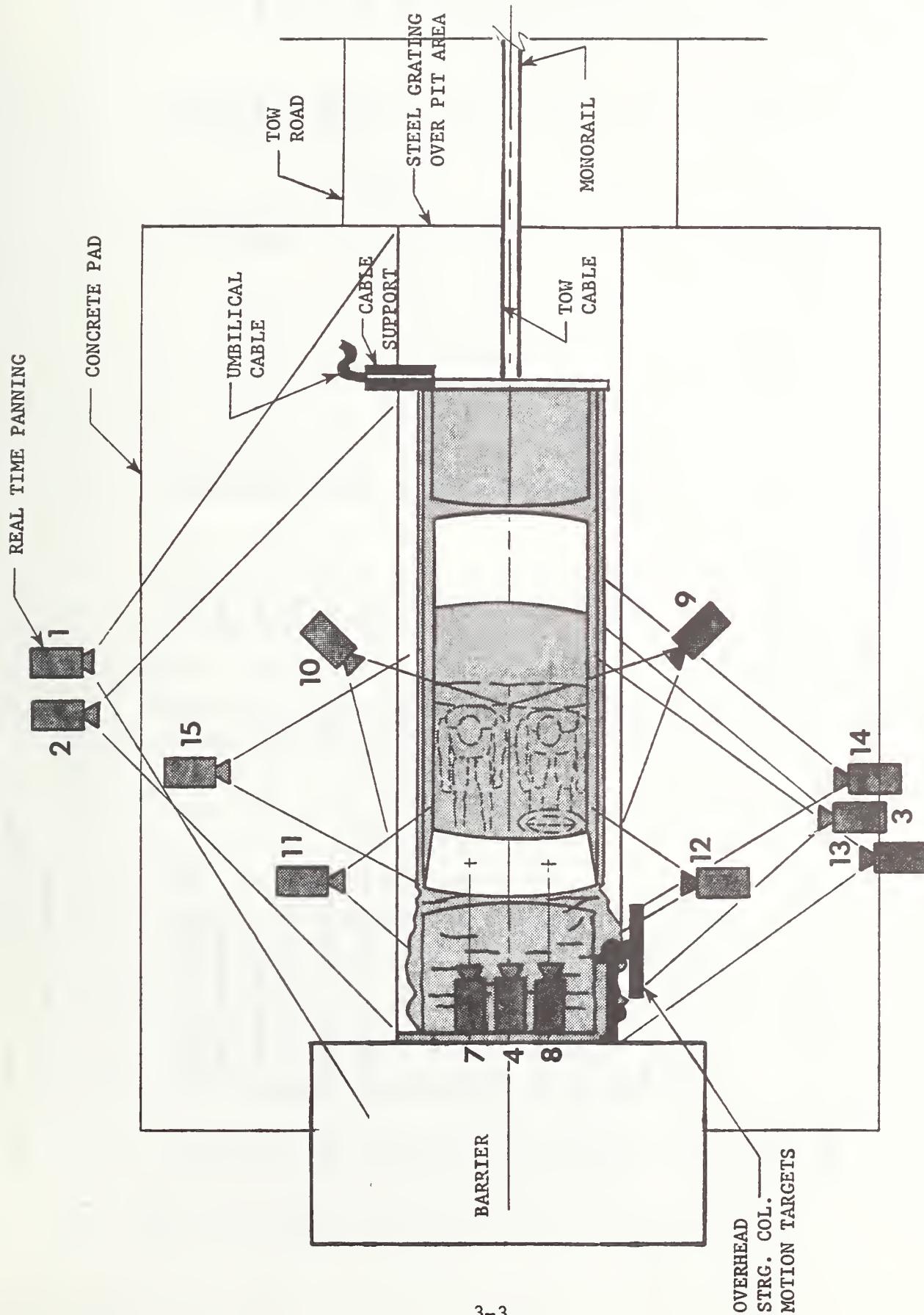
AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT. NA, vehicle did not contain a crash-deployed occupant protection system.

SECTION 3.0

CAMERA INFORMATION

CAMERA POSITIONS





HIGH SPEED CAMERA LOCATIONS

TEST NO.: 871216VEHICLE: Ford Escort

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			FILM PLANE			LENS (MM)	SPEED (FPS)
		X	Y	Z	ANGLE** (DEG)	TO HEAD TARGET			
1	Real time panning	-142.0	504.0	61.0	NA	NA	NA	16	24
2	Vehicle crush	-81.3	266.4	37.1	-2	NA	NA	13	500
3	Dummy kinematics	-41.5	-295.0	44.0	-4	263.0	25	505	
4	Windshield damage	-6.0	0.0	84.0	40	NA	NA	8.5	502
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	NA	13	1000
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	NA	13	1002
7	Pasenger kinematics	-4.5	13.8	93.0	-50	NA	NA	17	500
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	NA	17	500
9	Driver kinematics	-157.3	116.0	87.0	-27	128.5	25	500	
10	Pasenger kinematics	-152.1	-116.0	87.0	-26	123.8	25	500	
11	Windshield intrusion	-38.1	306.1	44.0	0	NA	NA	50	502
12	Windshield intrusion	-53.0	-309.4	42.3	0	NA	NA	50	502
13	Column movement	-91.5	-286.0	103.0	-14	NA	NA	25	498
14	Column movement	-91.5	-286.0	75.1	-9	NA	NA	25	500
15	Pasenger kinematics	-38.8	293.0	45.3	-4	261.3	25	502	

*X = Film plane to plane of barrier face

Y = Film plane to monorail centerline

Z = Film plane to ground

**Referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. PRE-TEST REAR VIEW
12. POST-TEST REAR VIEW
13. PRE-TEST WINDSHIELD VIEW
14. POST-TEST WINDSHIELD VIEW
15. PRE-TEST ENGINE COMPARTMENT VIEW
16. POST-TEST ENGINE COMPARTMENT VIEW
17. PRE-TEST FRONT UNDERBODY VIEW
18. POST-TEST FRONT UNDERBODY VIEW
19. PRE-TEST REAR UNDERBODY VIEW
20. POST-TEST REAR UNDERBODY VIEW
21. PRE-TEST DRIVER DUMMY POSITION VIEW
22. POST-TEST DRIVER DUMMY POSITION VIEW
23. PRE-TEST PASSENGER DUMMY POSITION VIEW
24. POST-TEST PASSENGER DUMMY POSITION VIEW
25. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
26. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
27. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
28. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
29. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
30. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
31. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
33. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1

APPENDIX A CONTINUED

PHOTOGRAPHS

34. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2
35. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3
36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4
37. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1
38. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2
39. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW
40. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW



Figure A-1. PRE-TEST FRONT VIEW



Figure A-2. POST-TEST FRONT VIEW
A-3

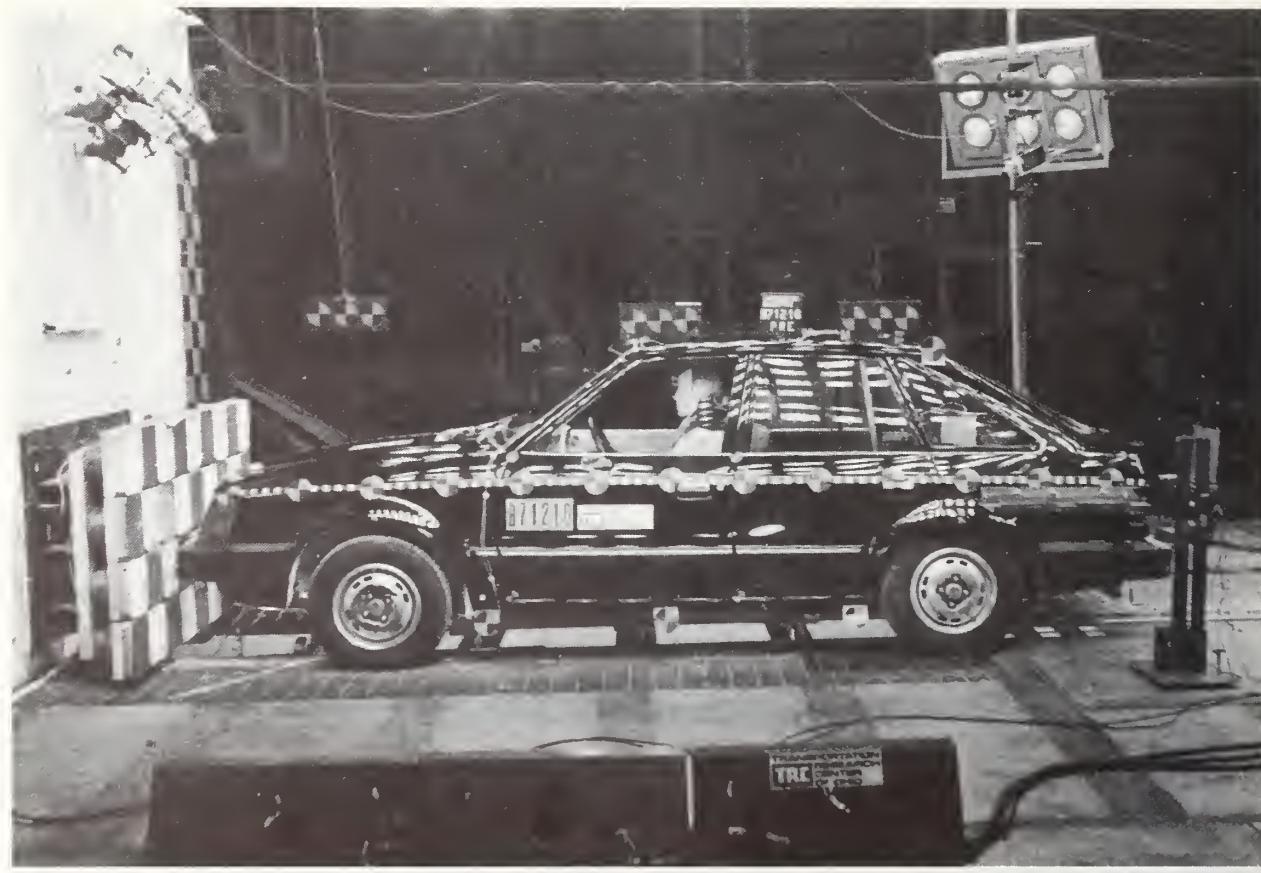


Figure A-3. PRE-TEST LEFT SIDE VIEW

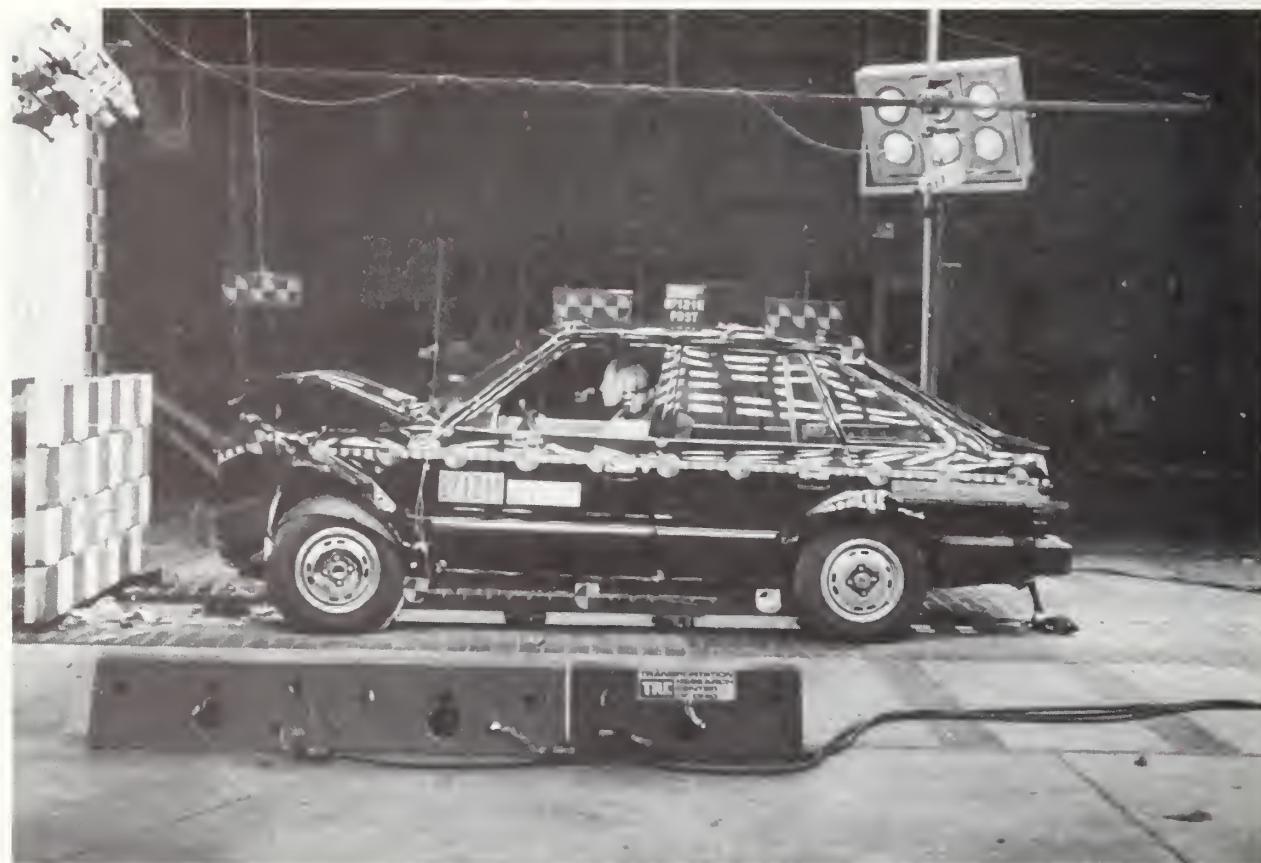


Figure A-4. POST-TEST LEFT SIDE VIEW
A-4



Figure A-5. PRE-TEST RIGHT SIDE VIEW

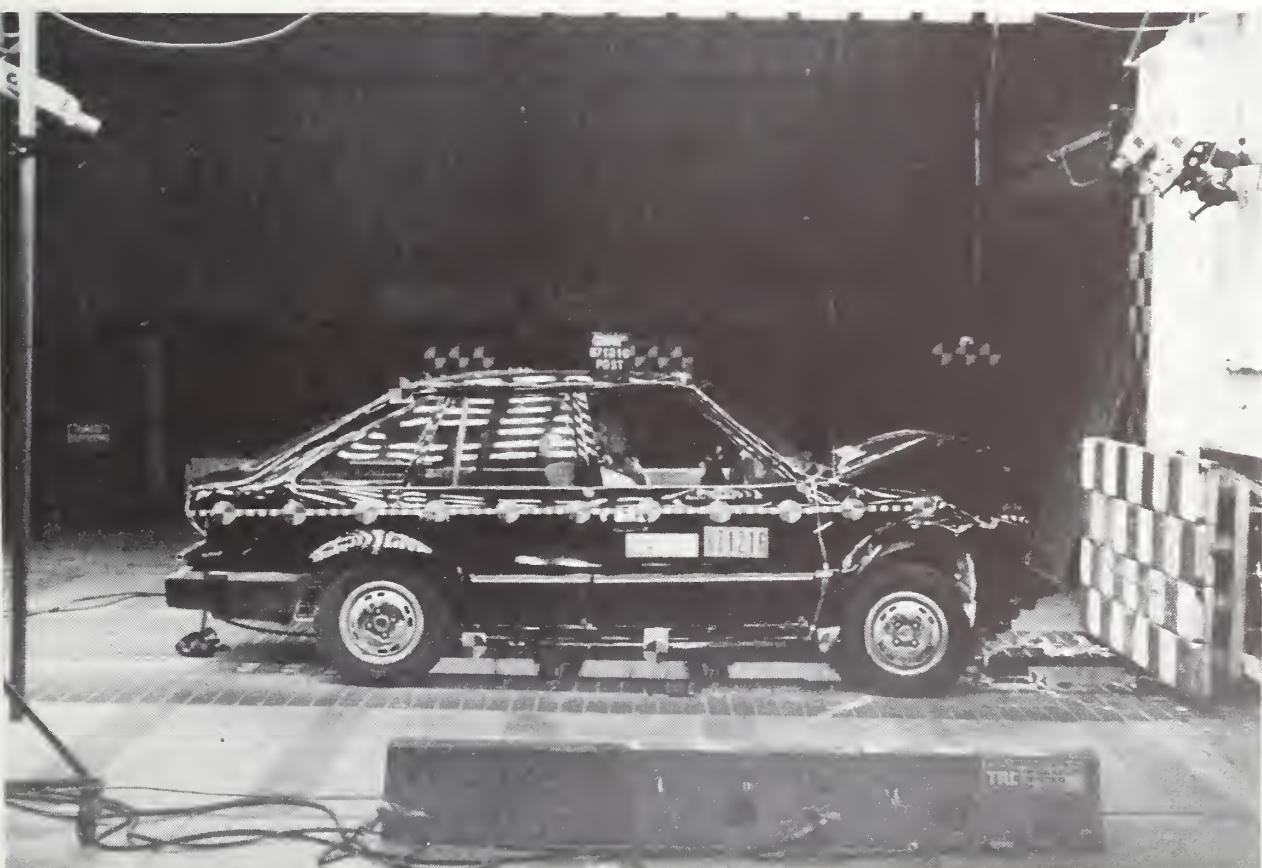


Figure A-6. POST-TEST RIGHT SIDE VIEW



Figure A-7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-9. PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-10. POST-TEST LEFT REAR THREE-QUARTER VIEW

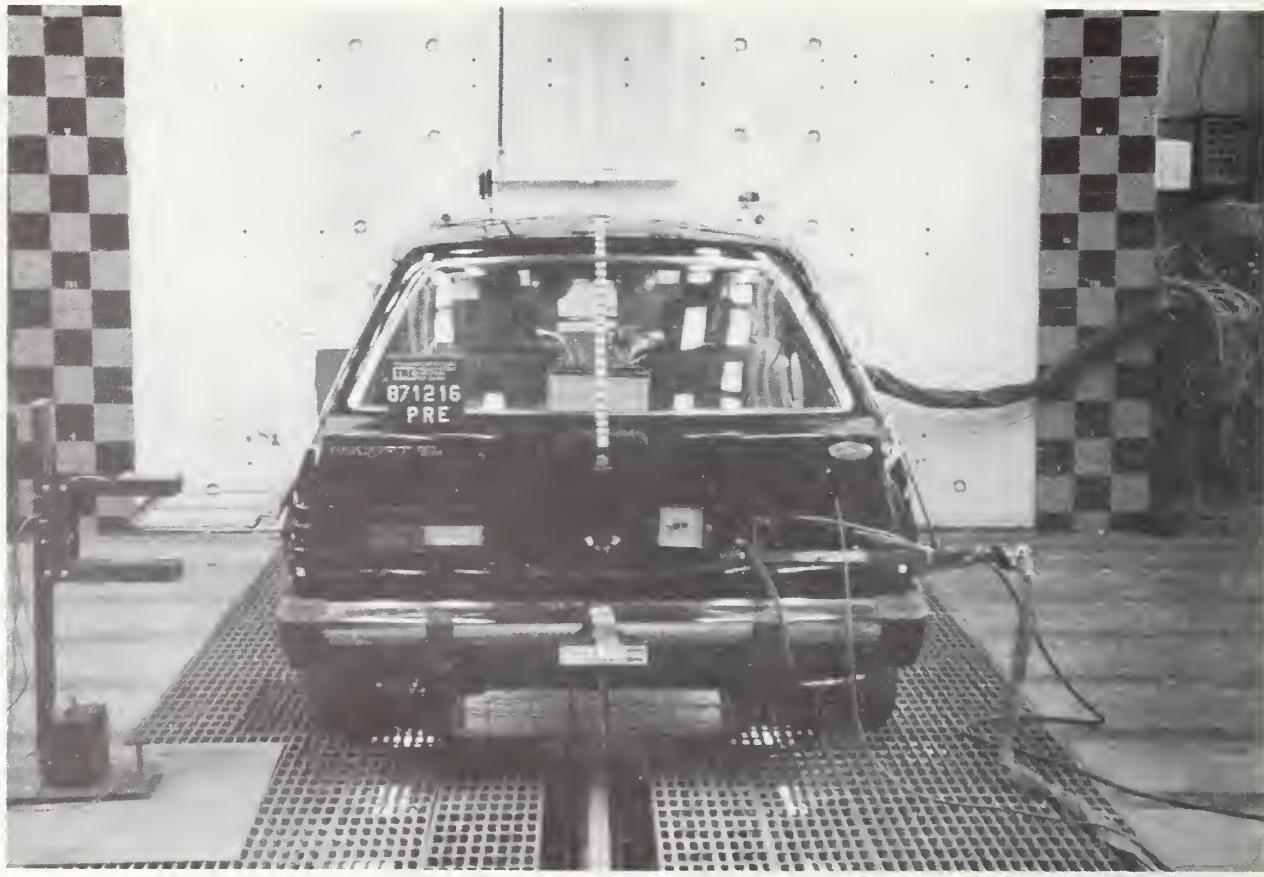


Figure A-11. PRE-TEST REAR VIEW

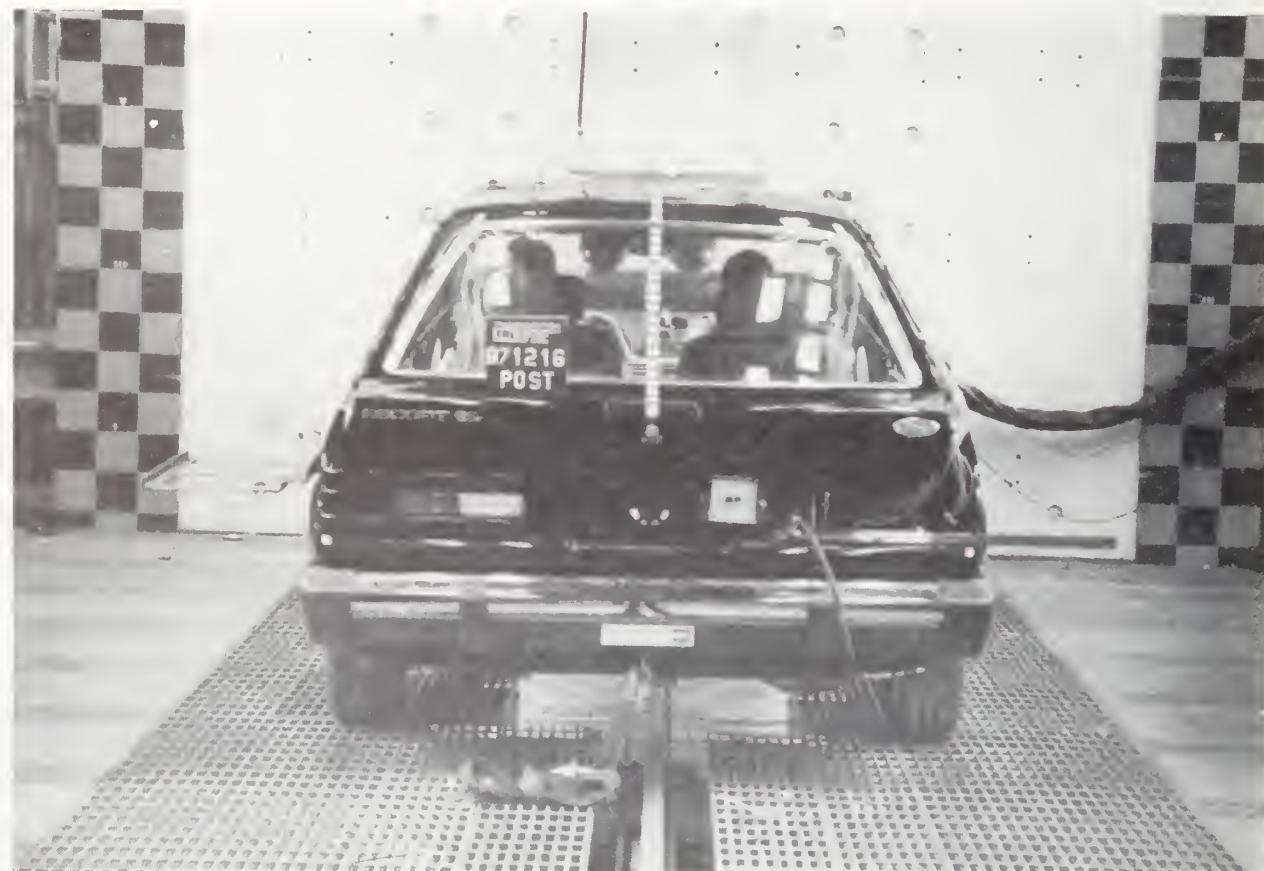


Figure A-12. POST-TEST REAR VIEW

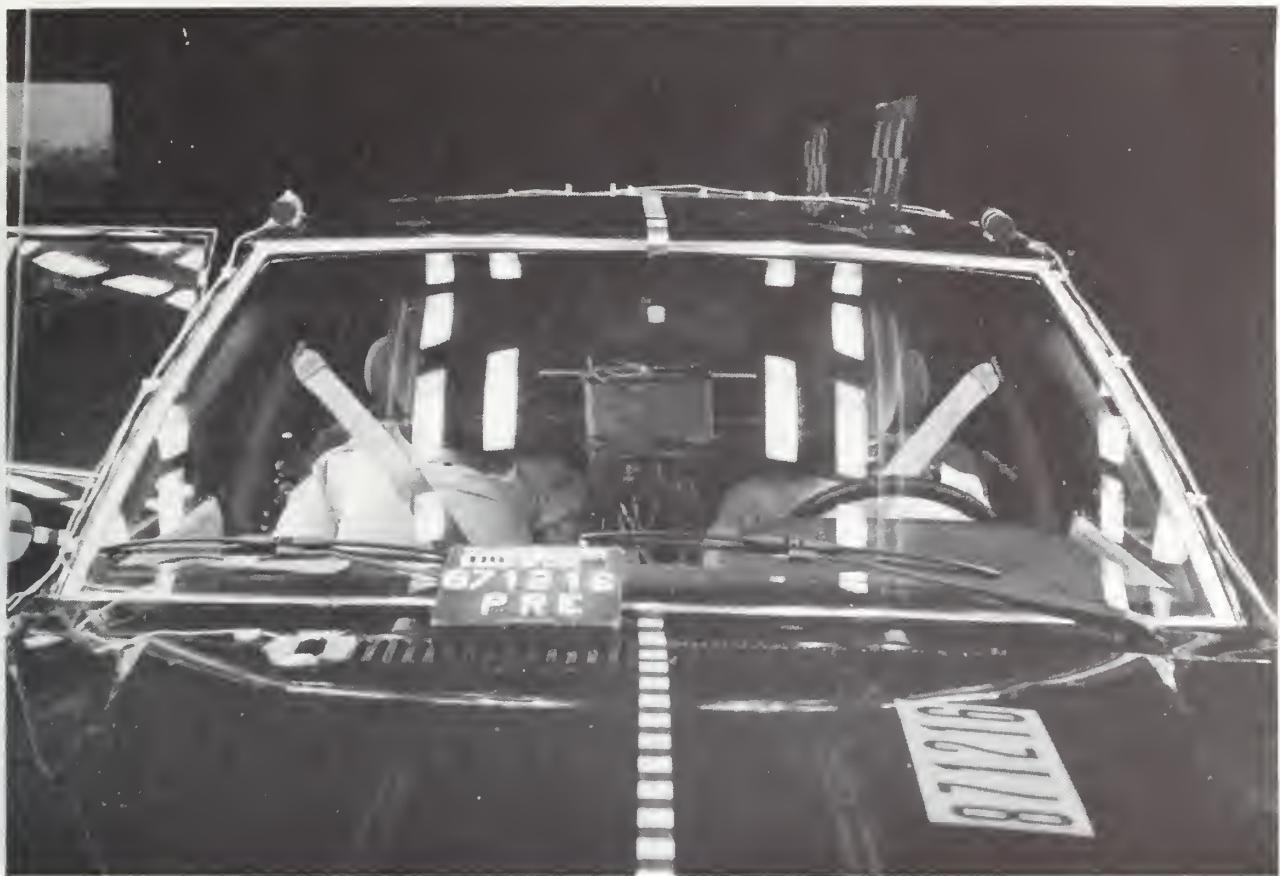


Figure A-13. PRE-TEST WINDSHIELD VIEW

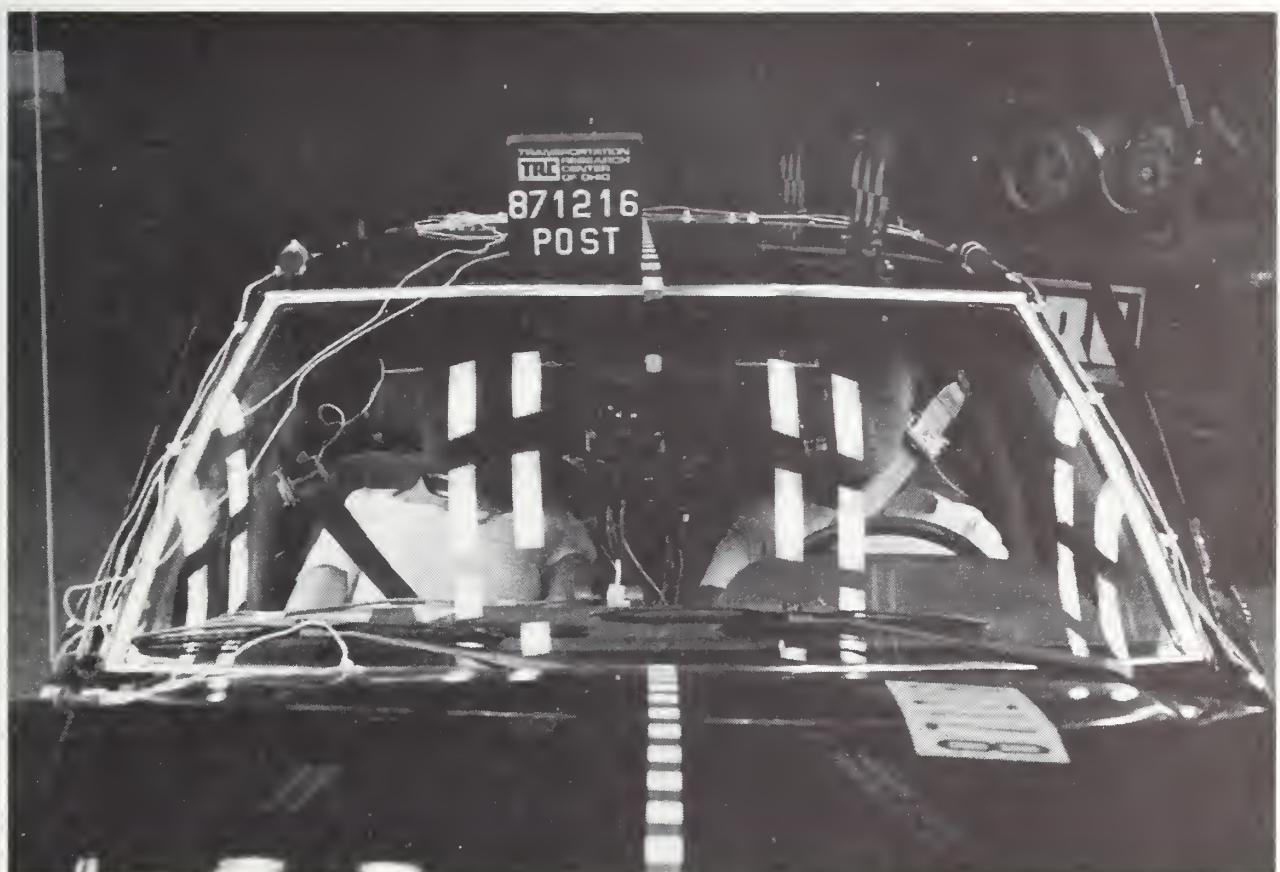


Figure A-14. POST-TEST WINDSHIELD VIEW
A-9

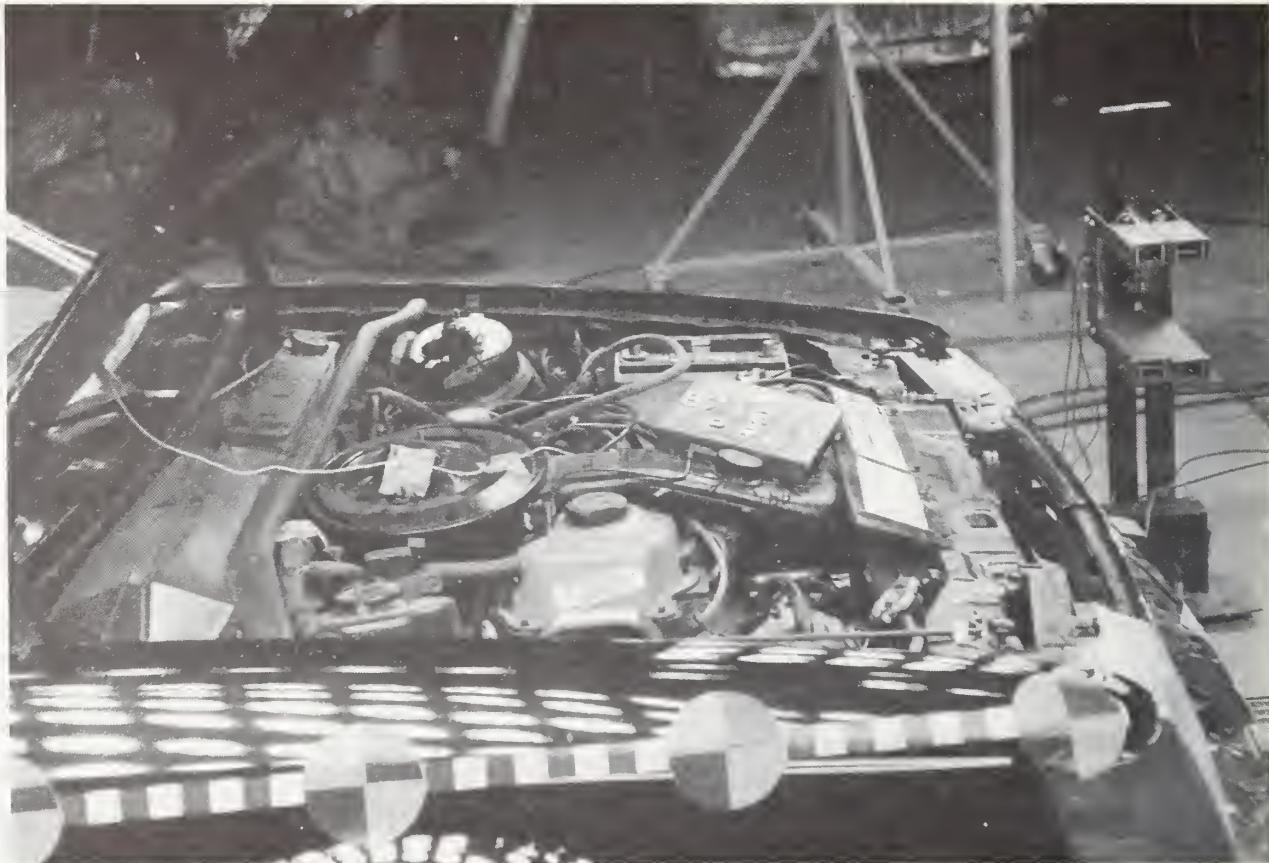


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW

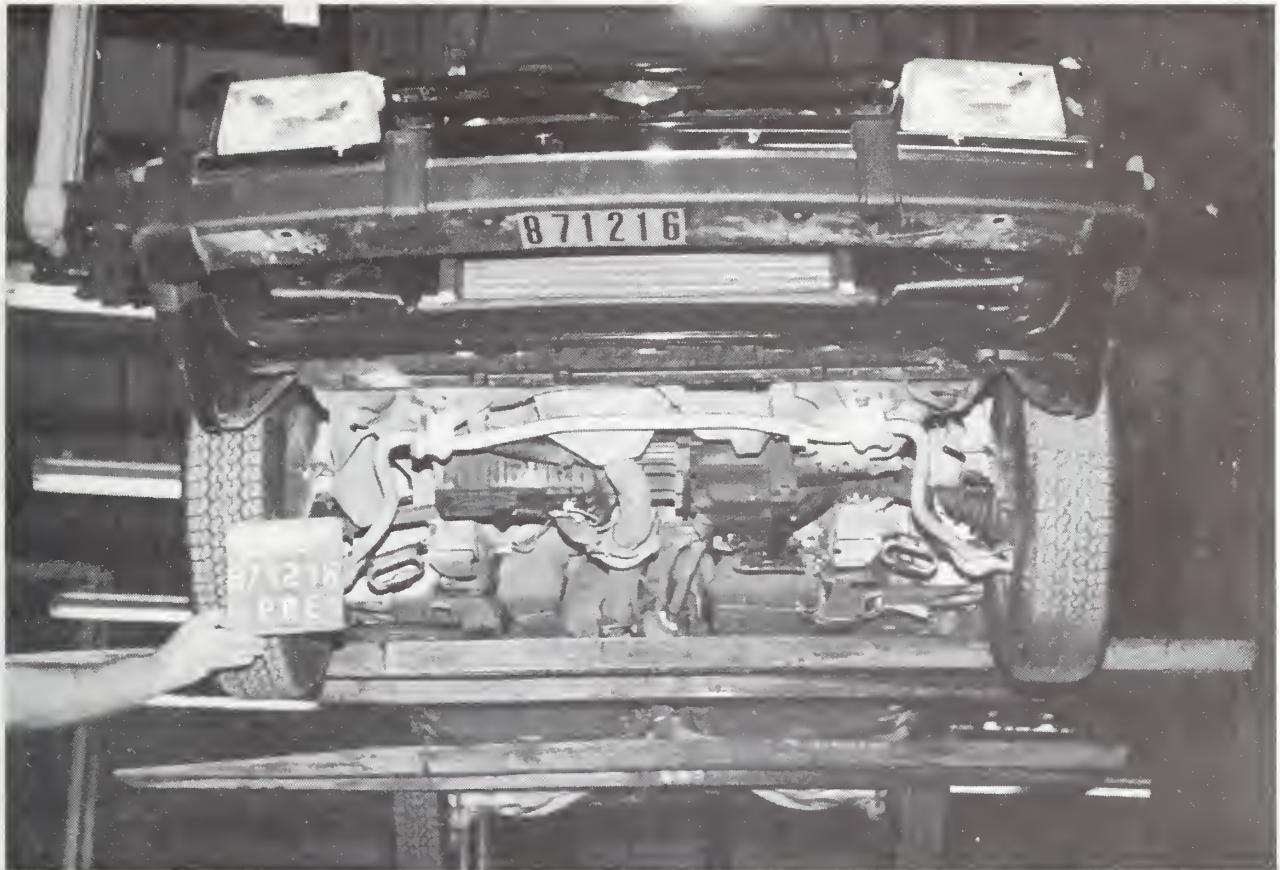


Figure A-17. PRE-TEST FRONT UNDERBODY VIEW

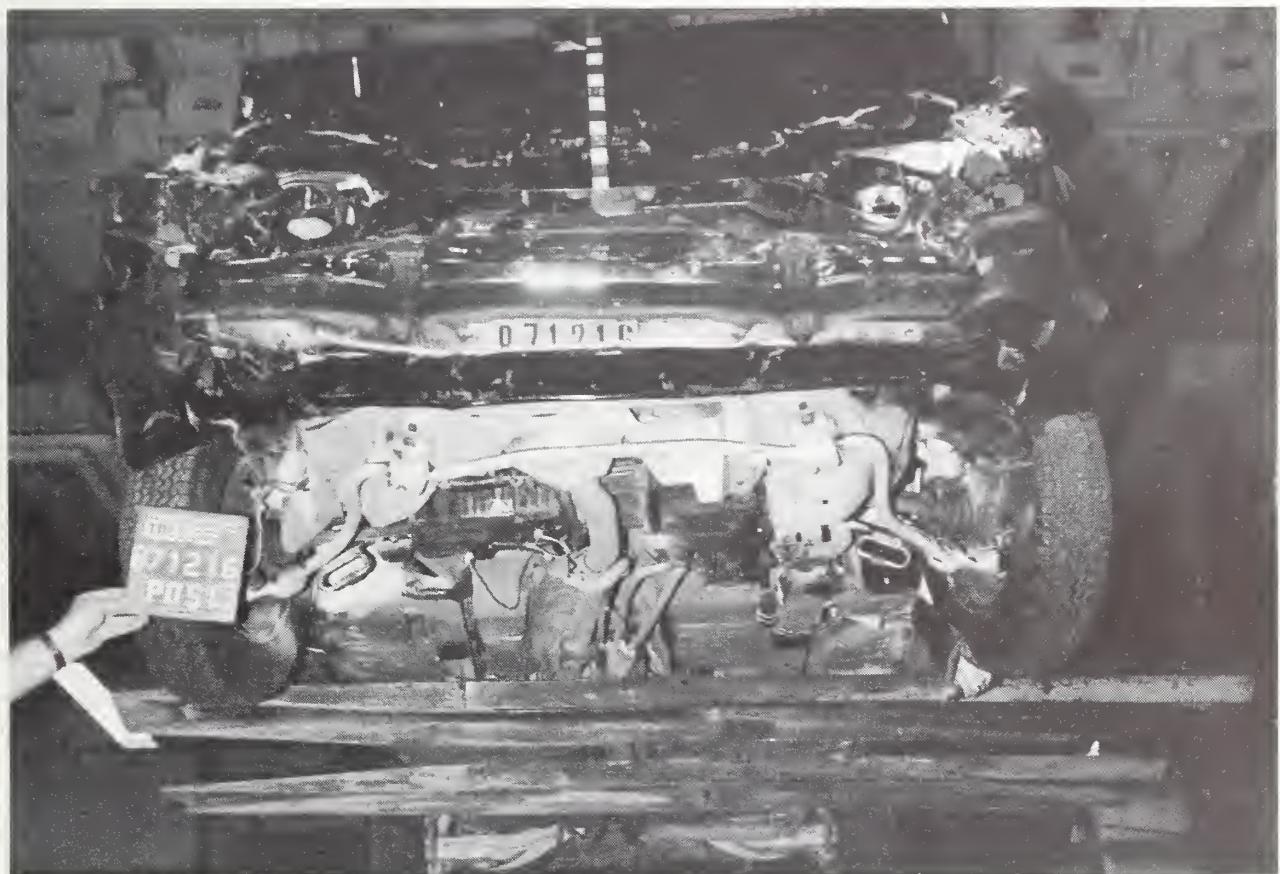


Figure A-18. POST-TEST FRONT UNDERBODY VIEW

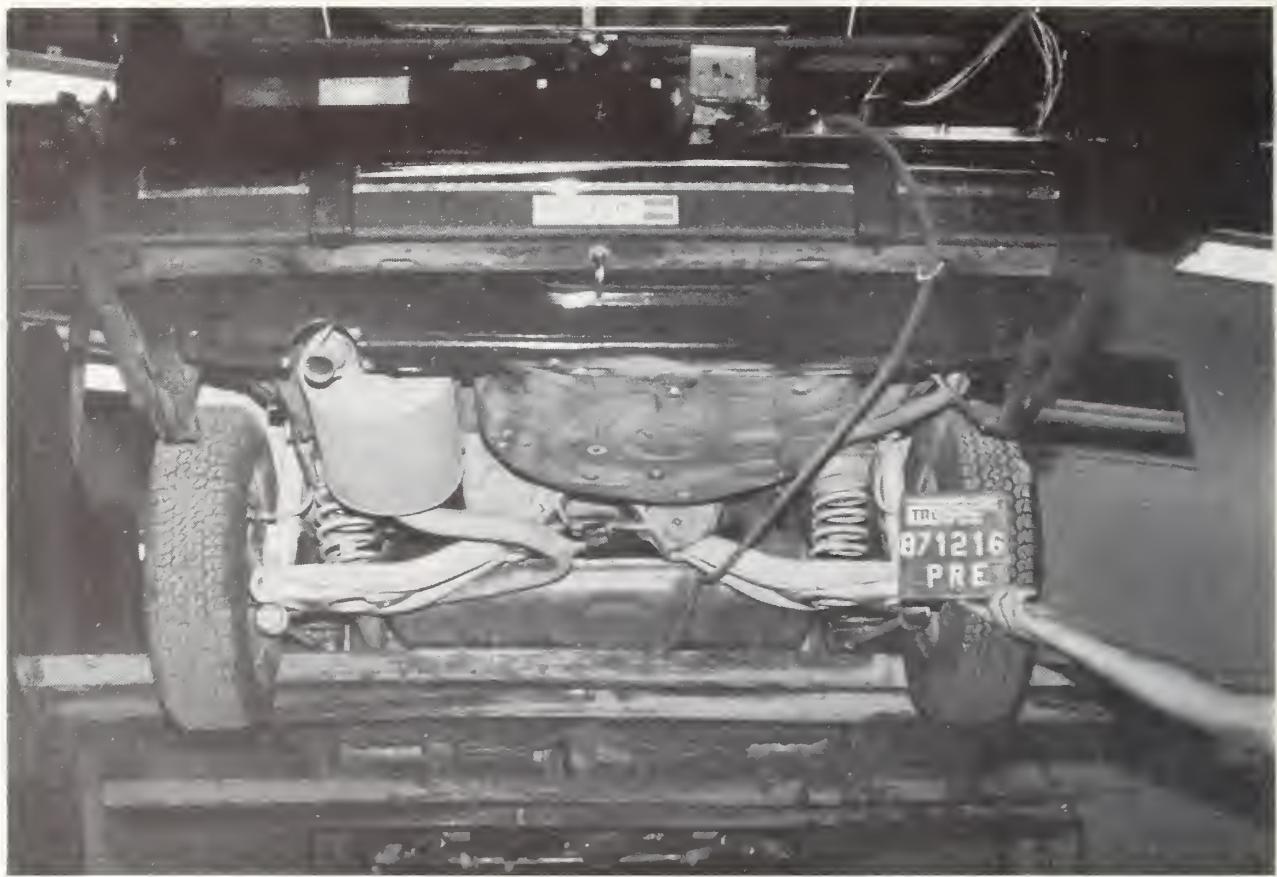


Figure A-19. PRE-TEST REAR UNDERBODY VIEW

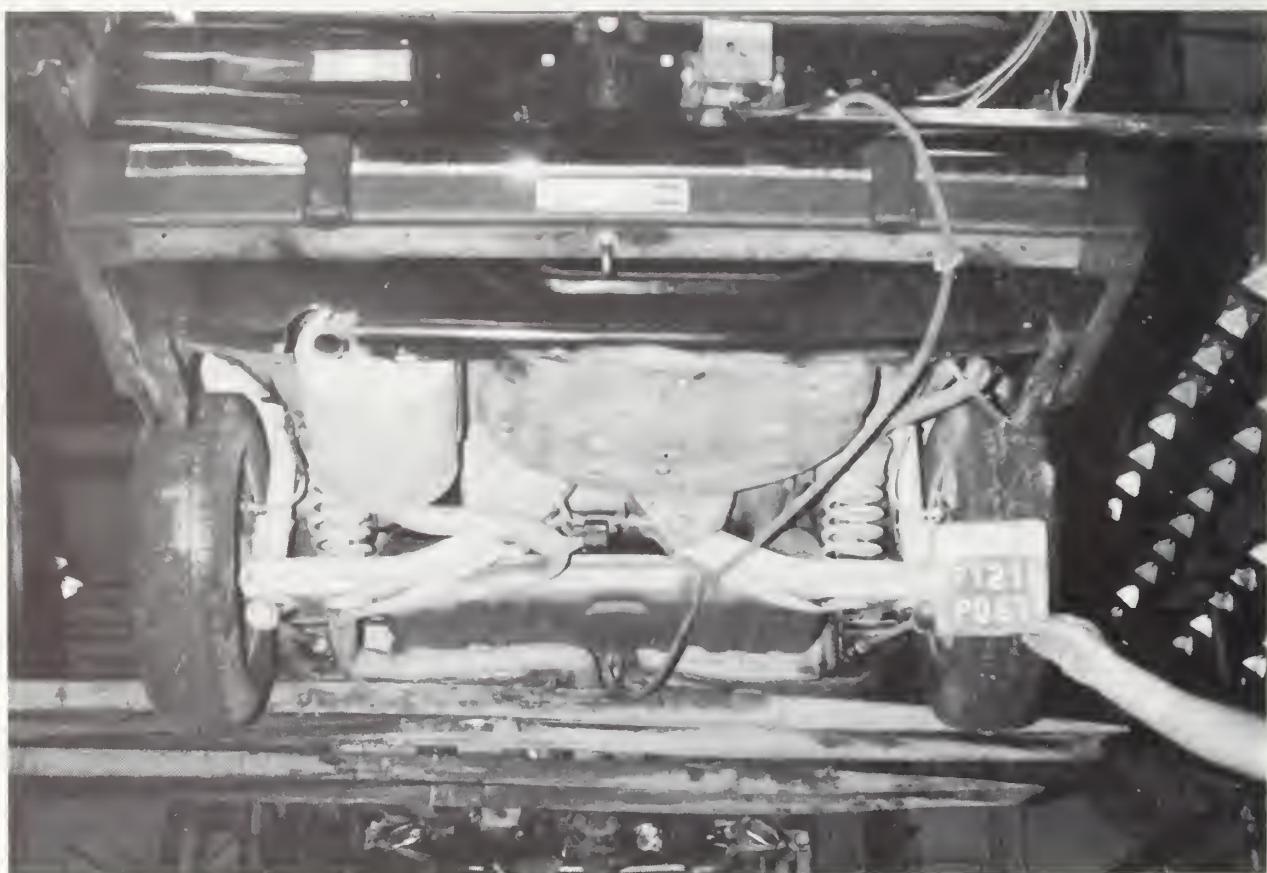


Figure A-20. POST-TEST REAR UNDERBODY VIEW



Figure A-21. PRE-TEST DRIVER DUMMY POSITION VIEW



Figure A-22. POST-TEST DRIVER DUMMY POSITION VIEW
A-13



Figure A-23. PRE-TEST PASSENGER DUMMY POSITION VIEW



Figure A-24. POST-TEST PASSENGER DUMMY POSITION VIEW



Figure A-25. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

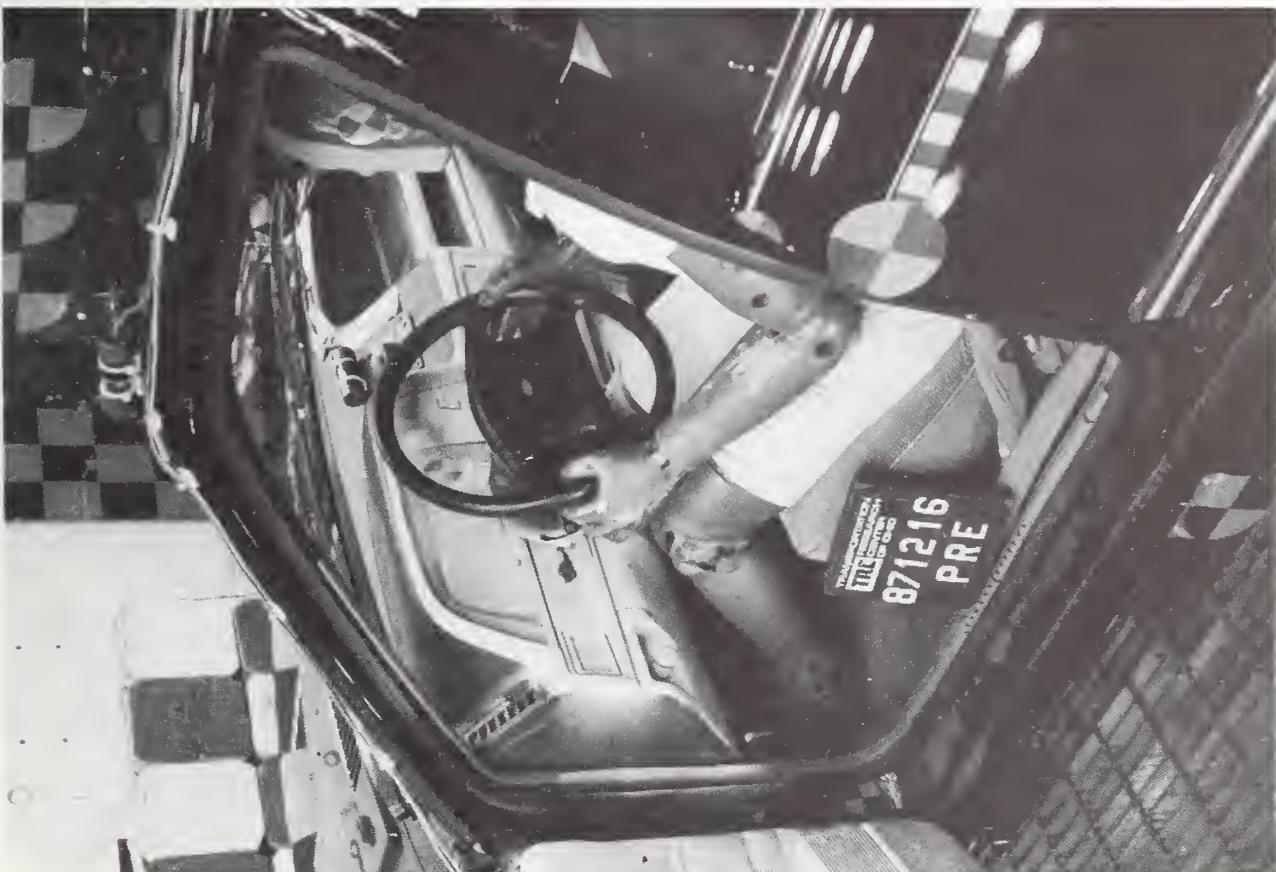


Figure A-26. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

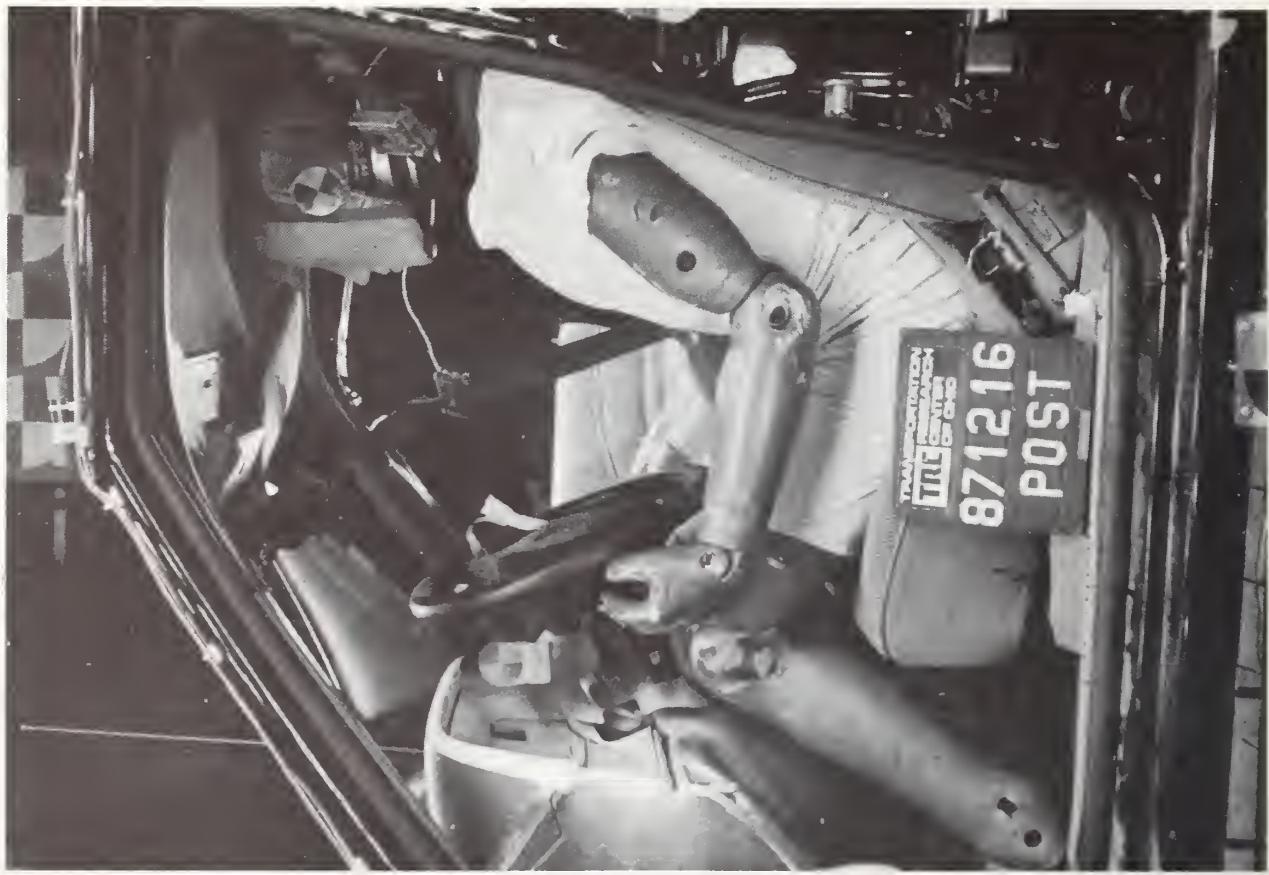


Figure A-27. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-28. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

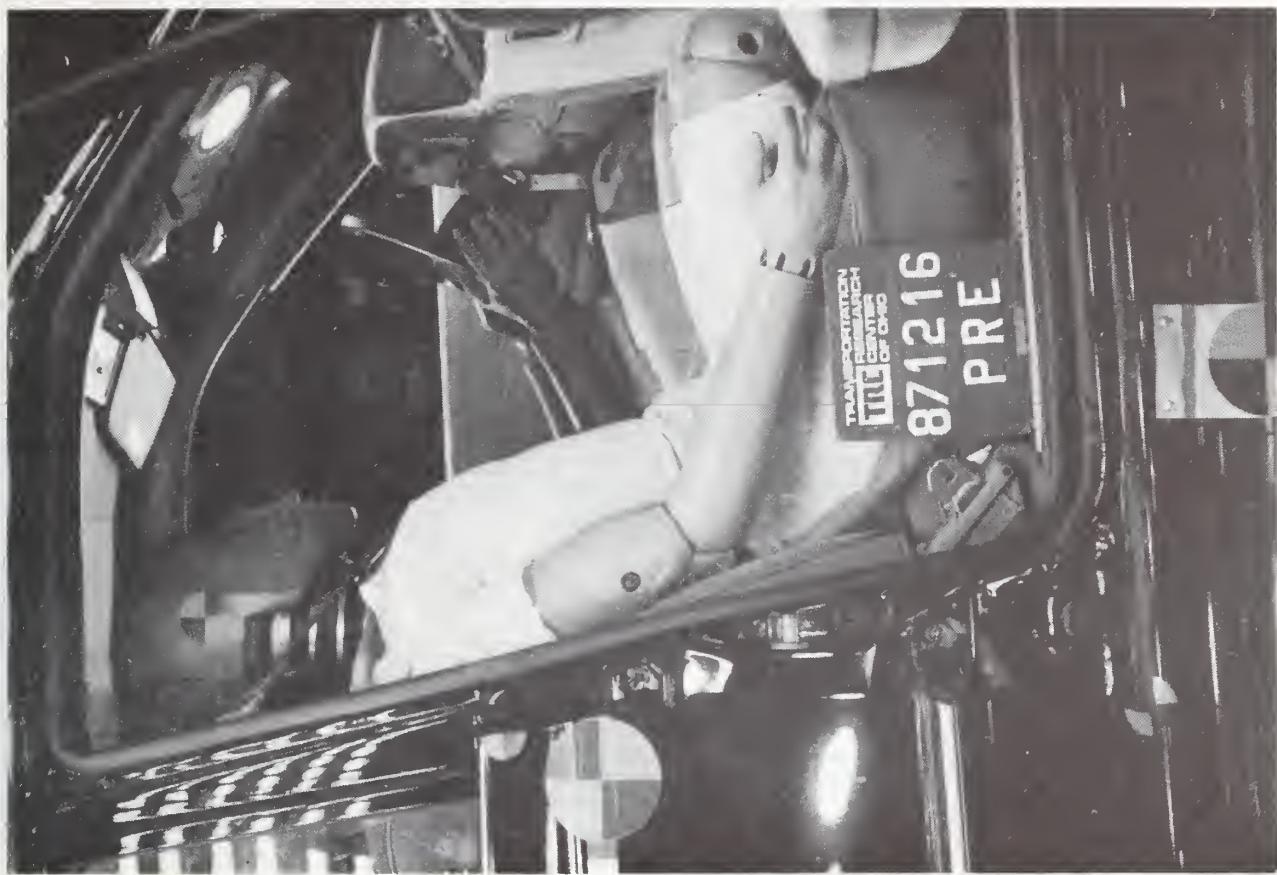


Figure A-29. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-30. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-31. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

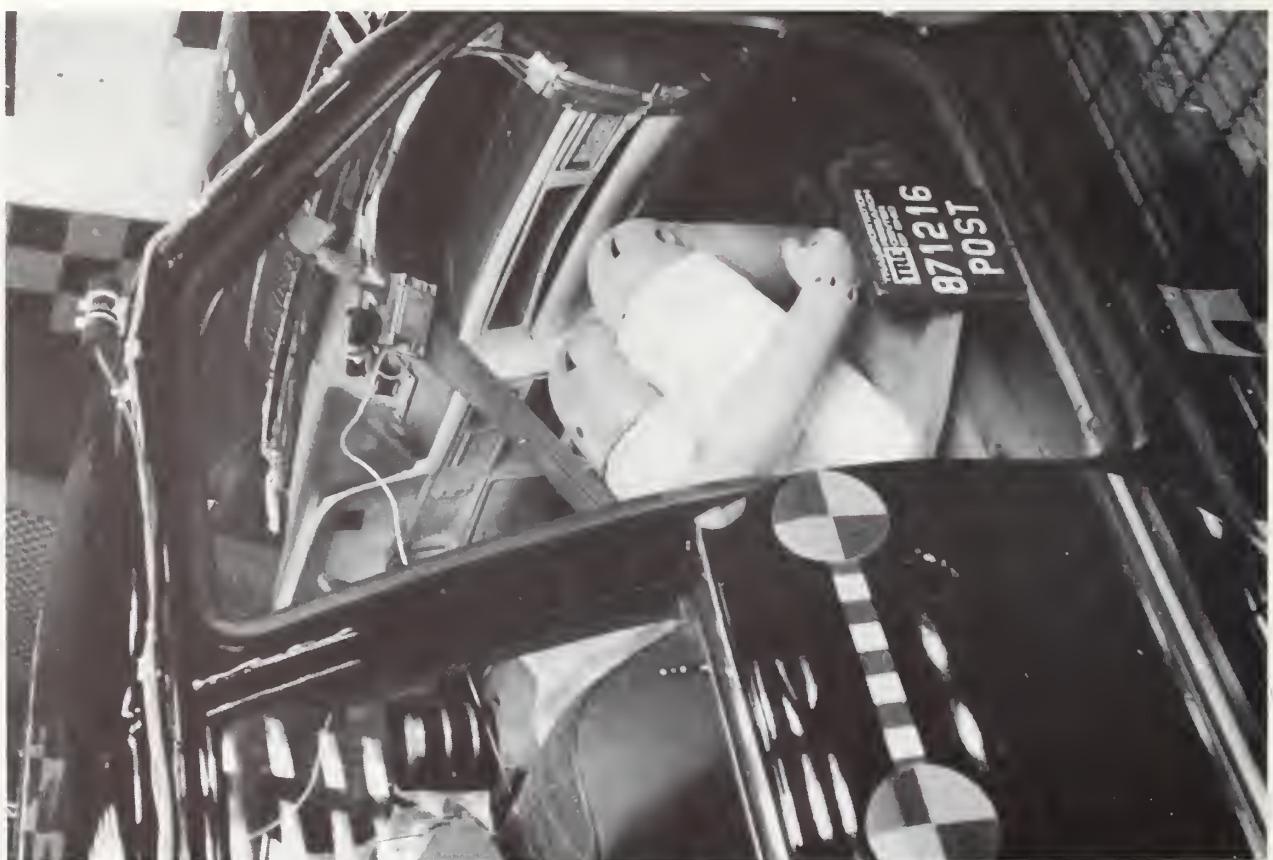


Figure A-32. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-33. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1



Figure A-34. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2



Figure A-35. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 3



Figure A-36. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 4



Figure A-37. POST-TEST PASSENGER DUMMY/KNEE CONTACT - VIEW 1



Figure A-38. POST-TEST PASSENGER DUMMY/KNEE CONTACT - VIEW 2



Figure A-39. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

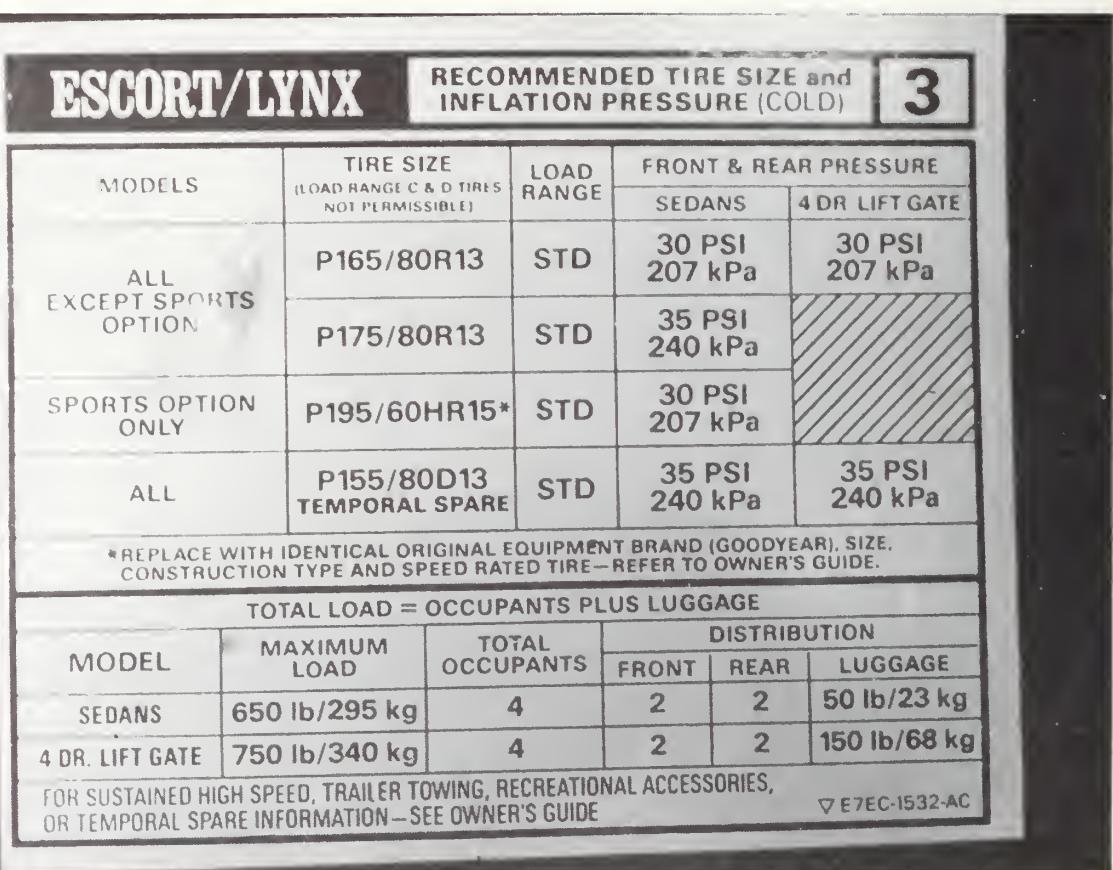


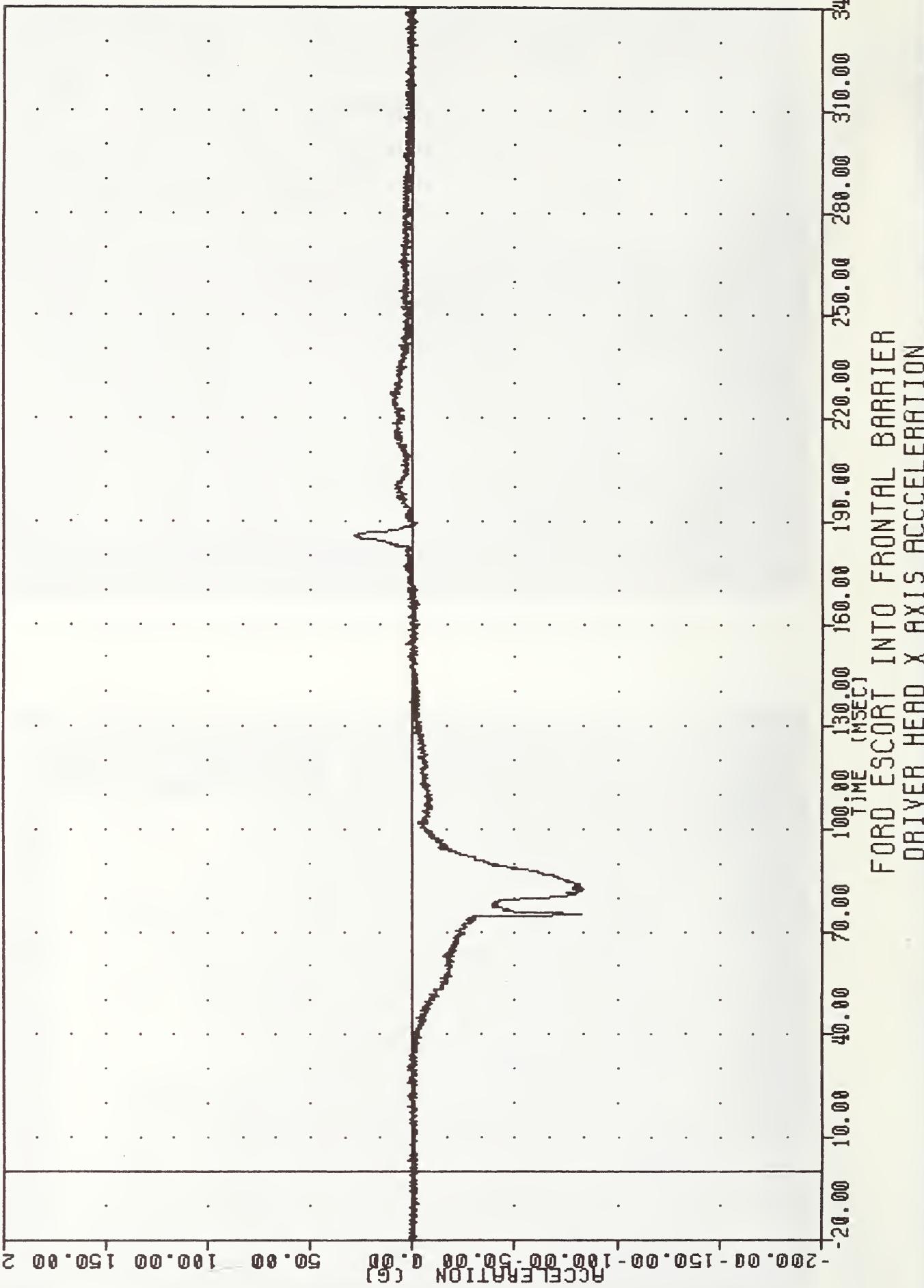
Figure A-40. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

APPENDIX B

DATA PLOTS

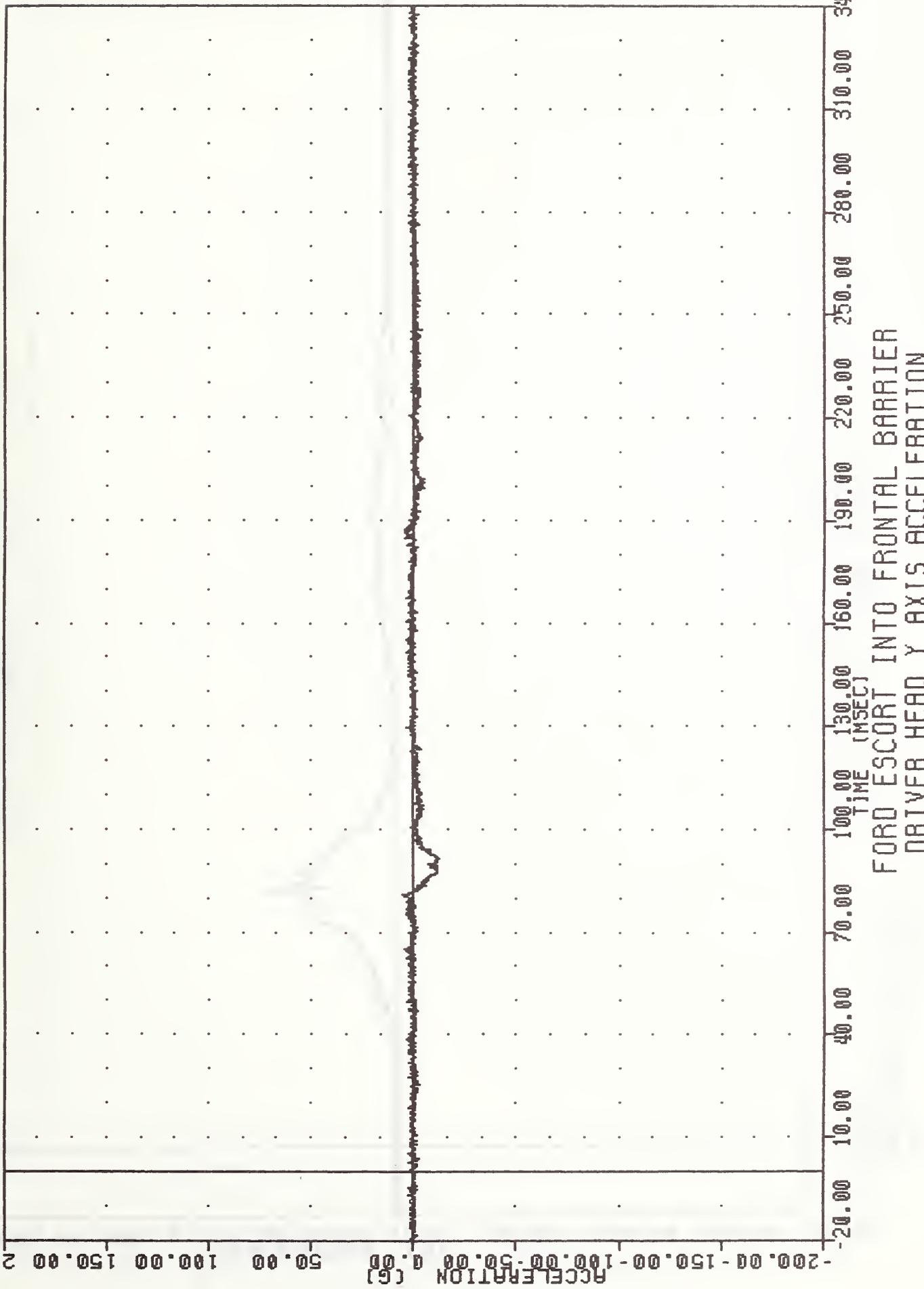
TRC 871216
200 FRONTAL CRASH TEST
87350
HDX61

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -83.428 82.38 , 28.82 & 185.63



TAC 871216
208 FRONTAL CRASH TEST
87350 HEDY G1

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -12.0008 91.63 , 5.42 6 80.75

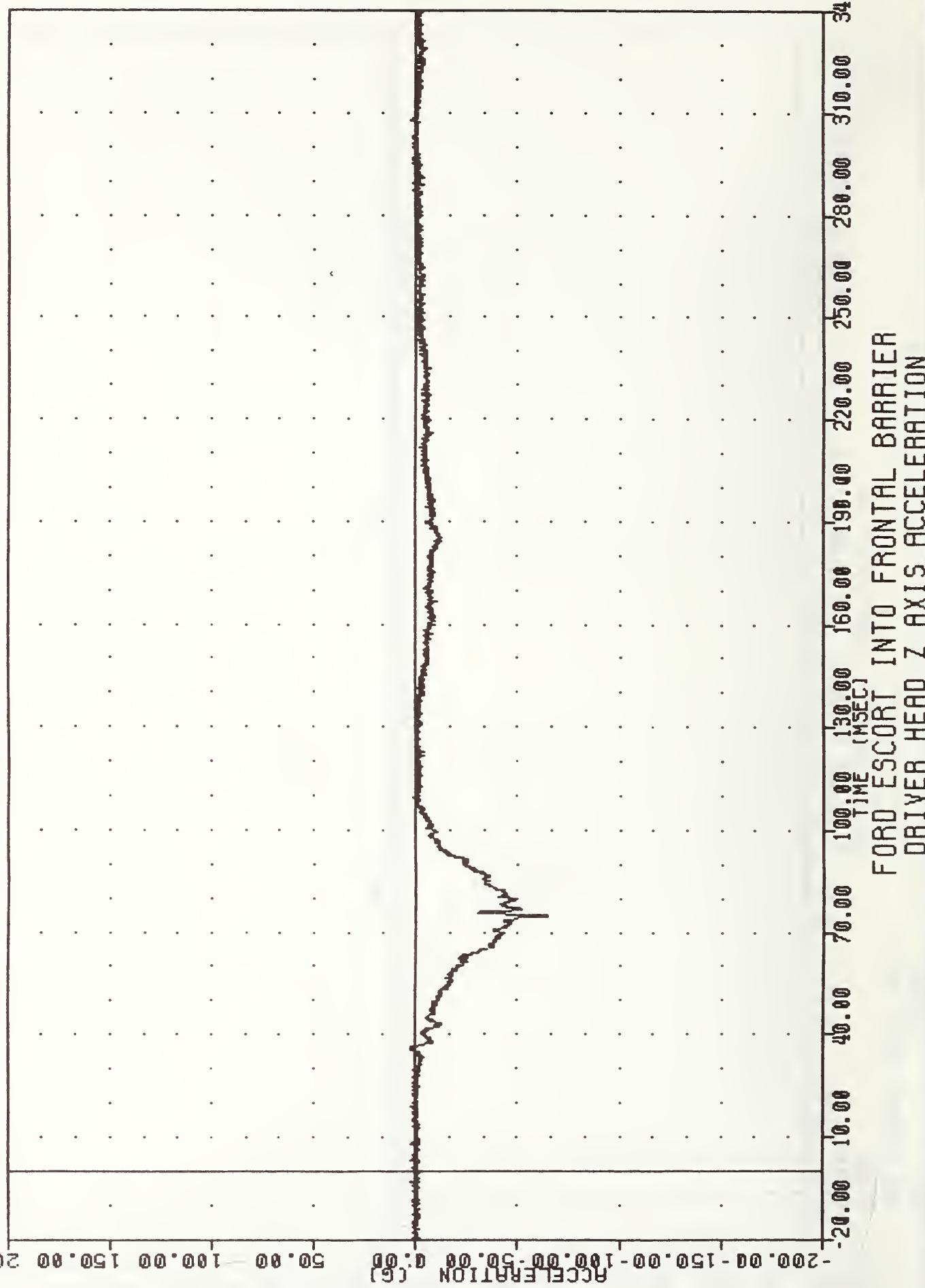


FORD ESCORT INTO FRONTAL BARRIER
DRIVER HEAD Y AXIS ACCELERATION

TRC 871216
200 FRONTAL CRASH TEST
87350

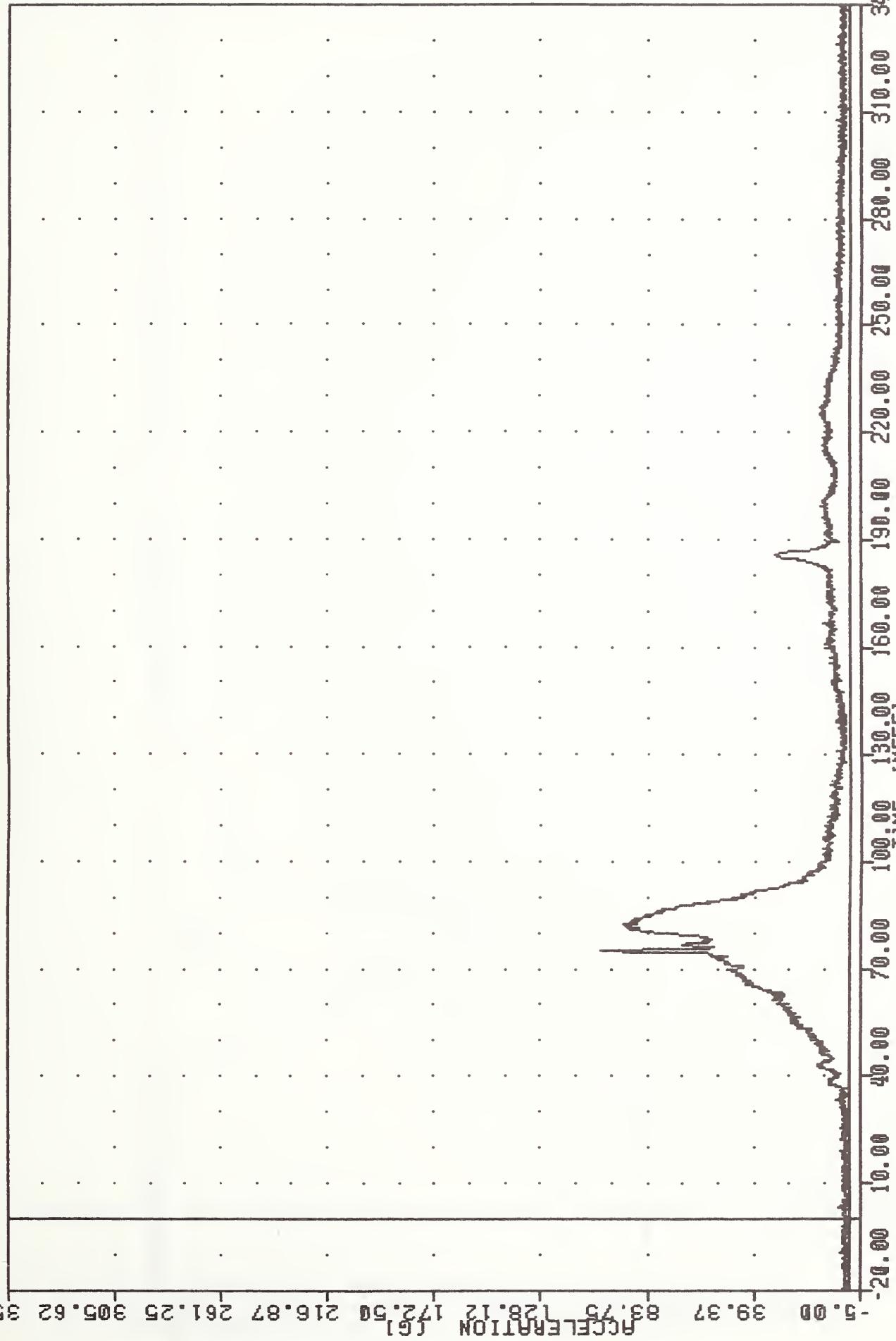
HE0ZG1

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -64.61@ 74.88 , 2.81 @ 307.75



TRC 871216
200 FRONTAL CRASH TEST
87350 HEDRG1

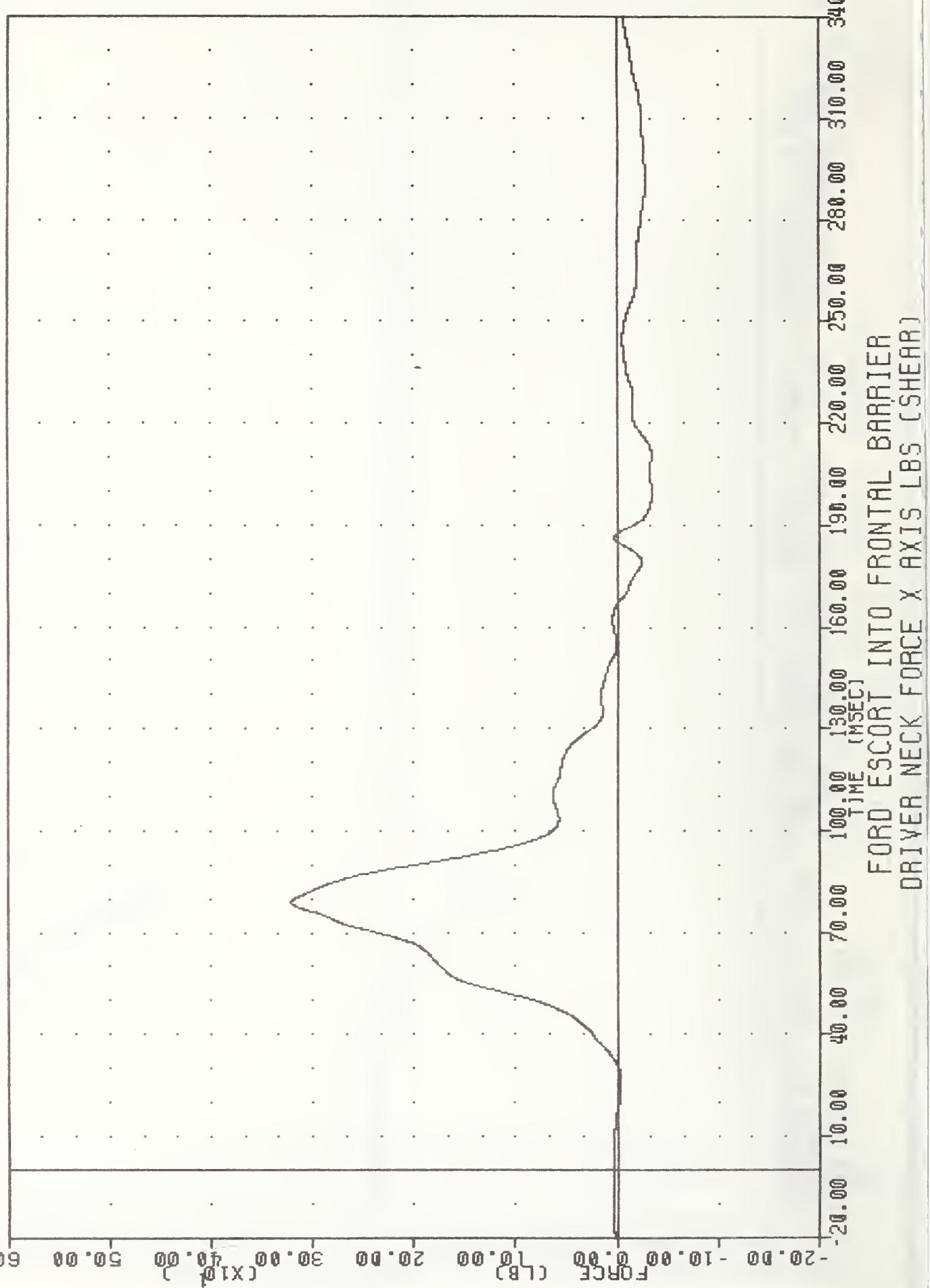
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.158 -6.88 , 103.14 & 75.00



FORD ESCORT INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

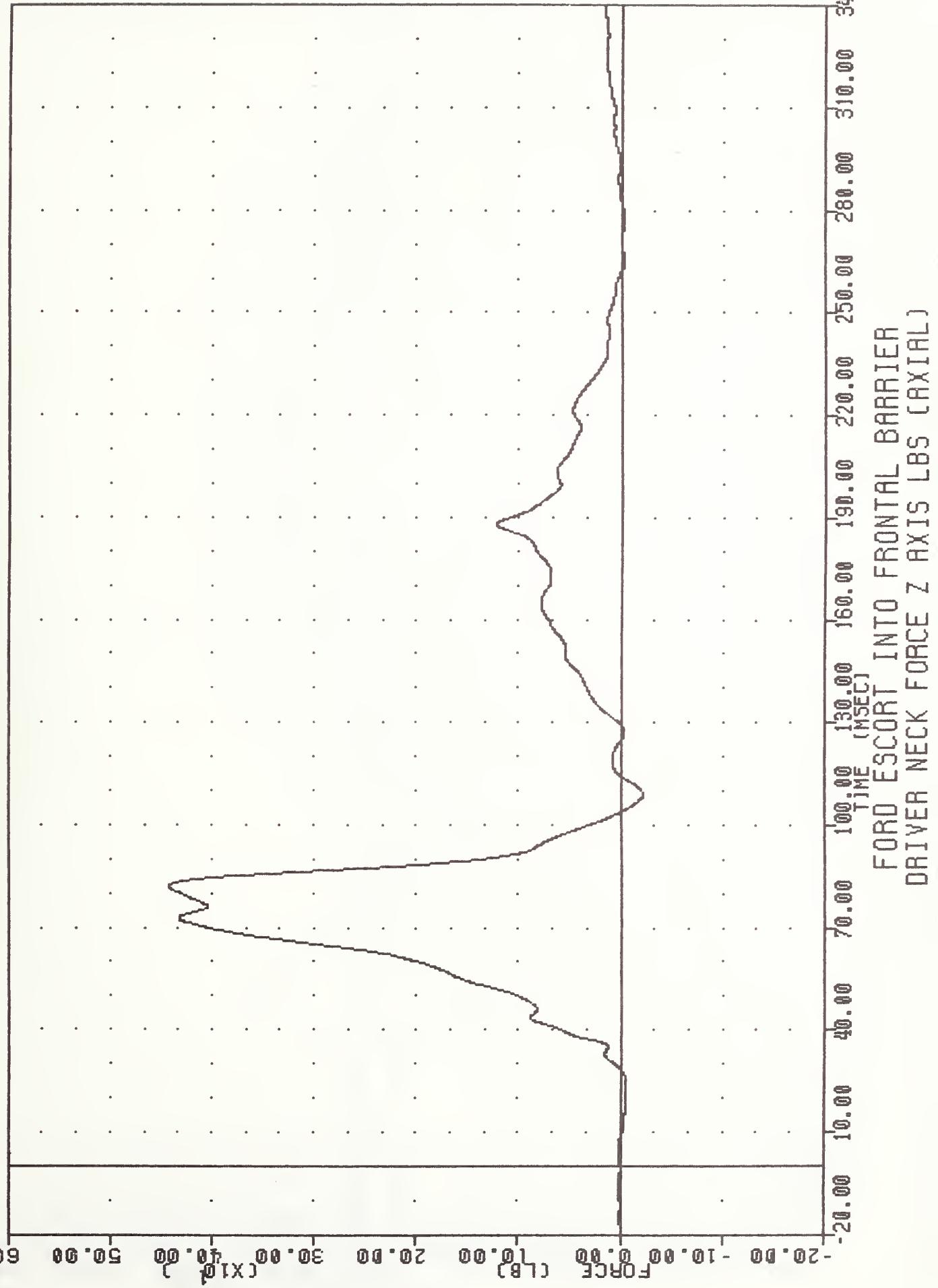
TRC 871216
200 FRONTAL CRASH TEST
87350
NEKXF1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -35.81@ 199.75 , 320.86 @ 78.88



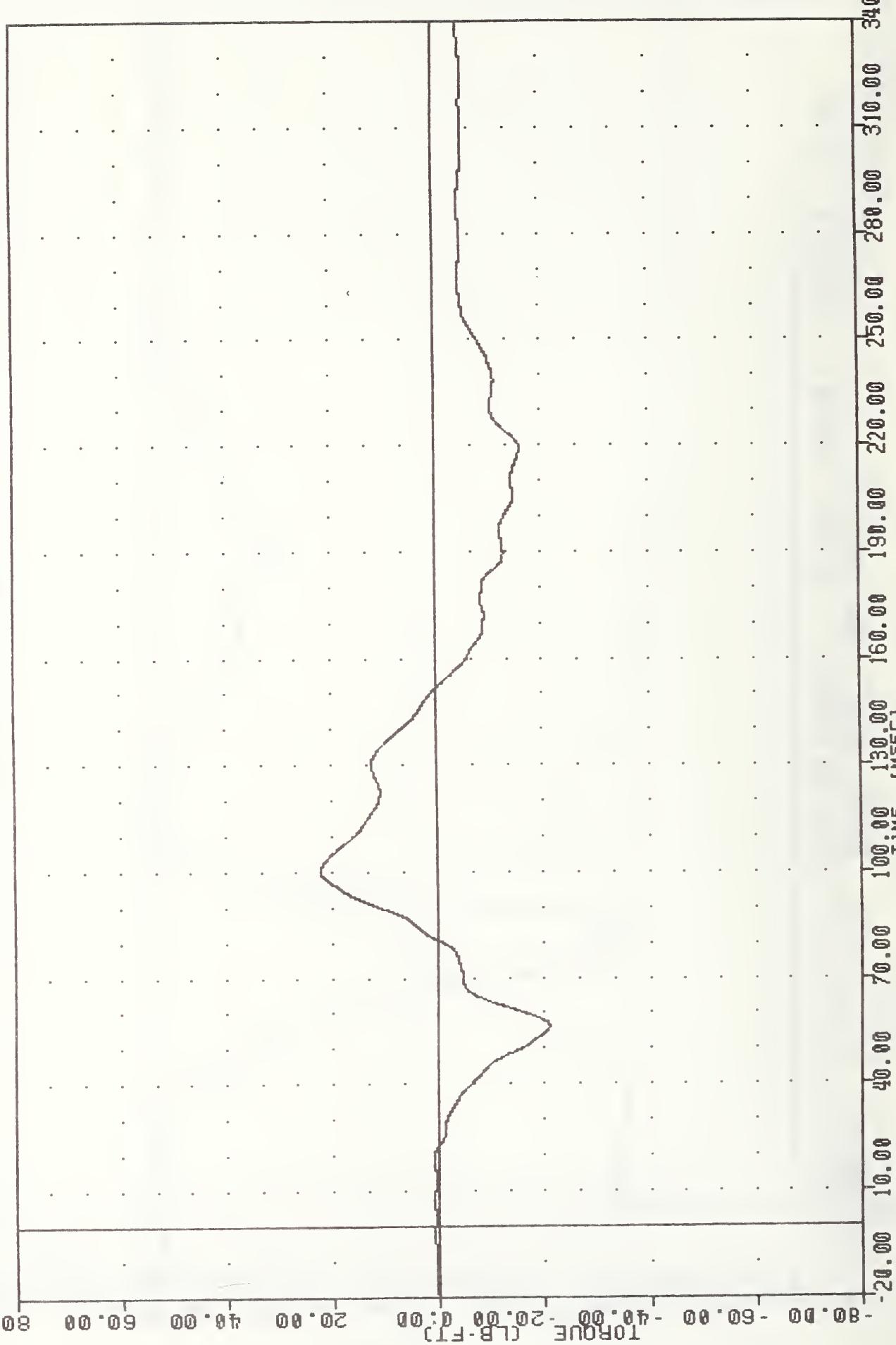
TRC • 871216
2008 FRONTAL CRASH TEST
87350
NEKZF1

FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -21.728 108.88 , 441.98 & 82.00



TRC • 871216
200 FRONTAL CRASH TEST
87350
NEKYM1

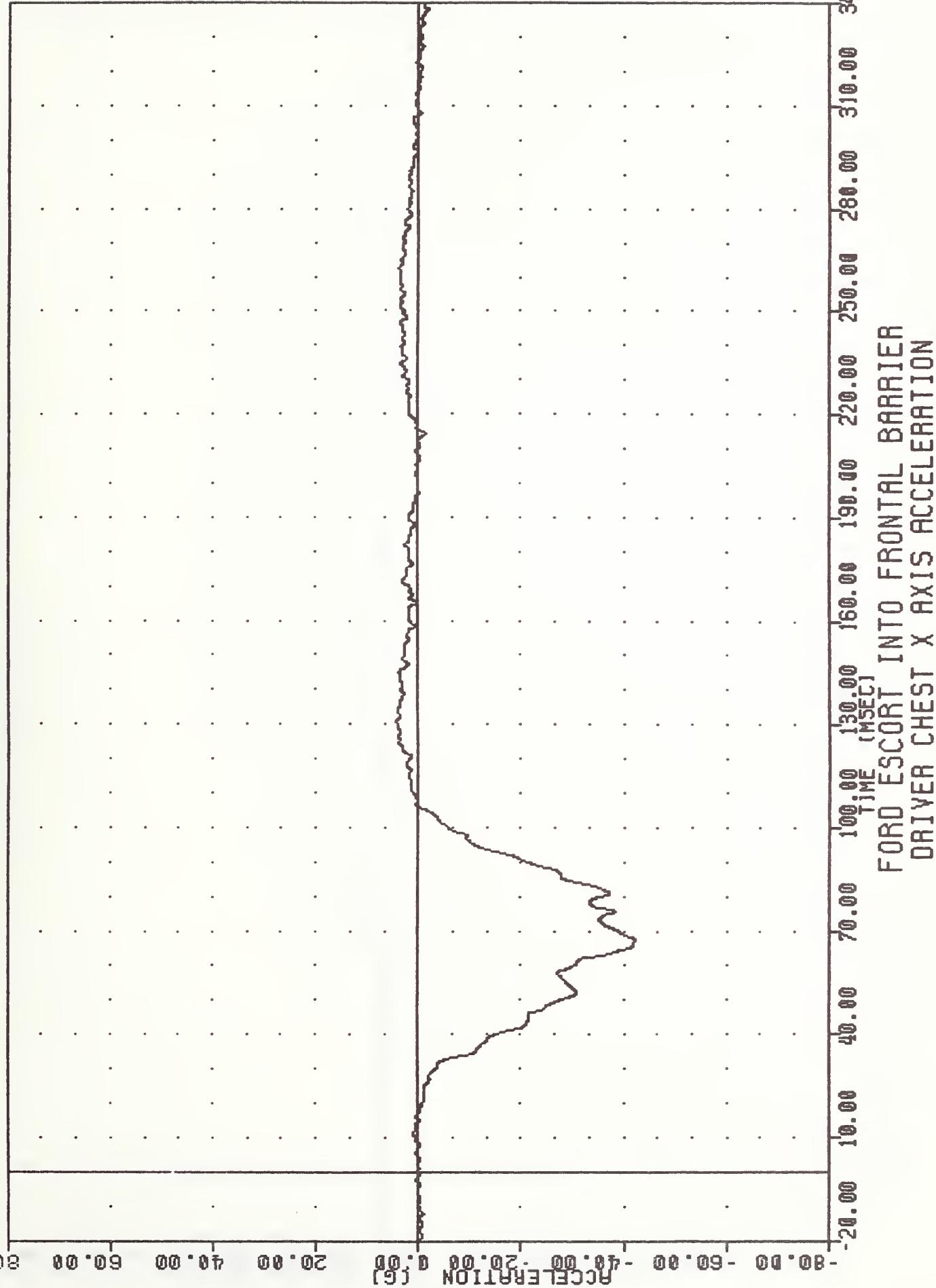
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -20.948 56.25
22.21 8 100.13



TIME (msec)
FORD ESCORT INTO FRONTAL BARRIER
DRIVER NECK MOMENT Y AXIS FT-LBS

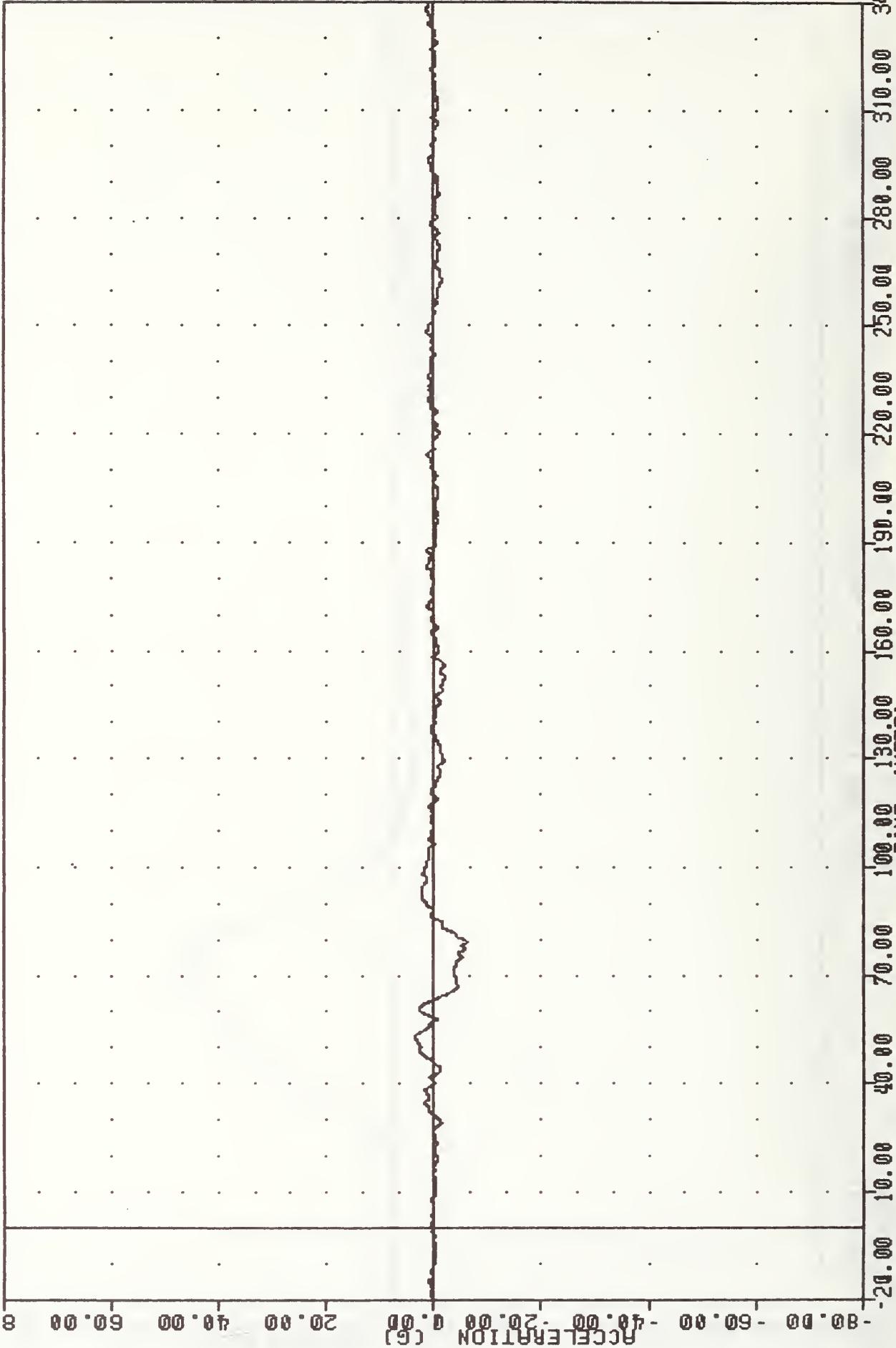
TRC
209 FRONTAL CRASH TEST
87350
CSTX61

FILTER = BLPP 3000/ 750/-16
MIN. MAX VALUES = -42.31@ 67.25 .
4.31 @ 130.88



TRC 871216
200 FRONTAL CRASH TEST
87350
CSTY61

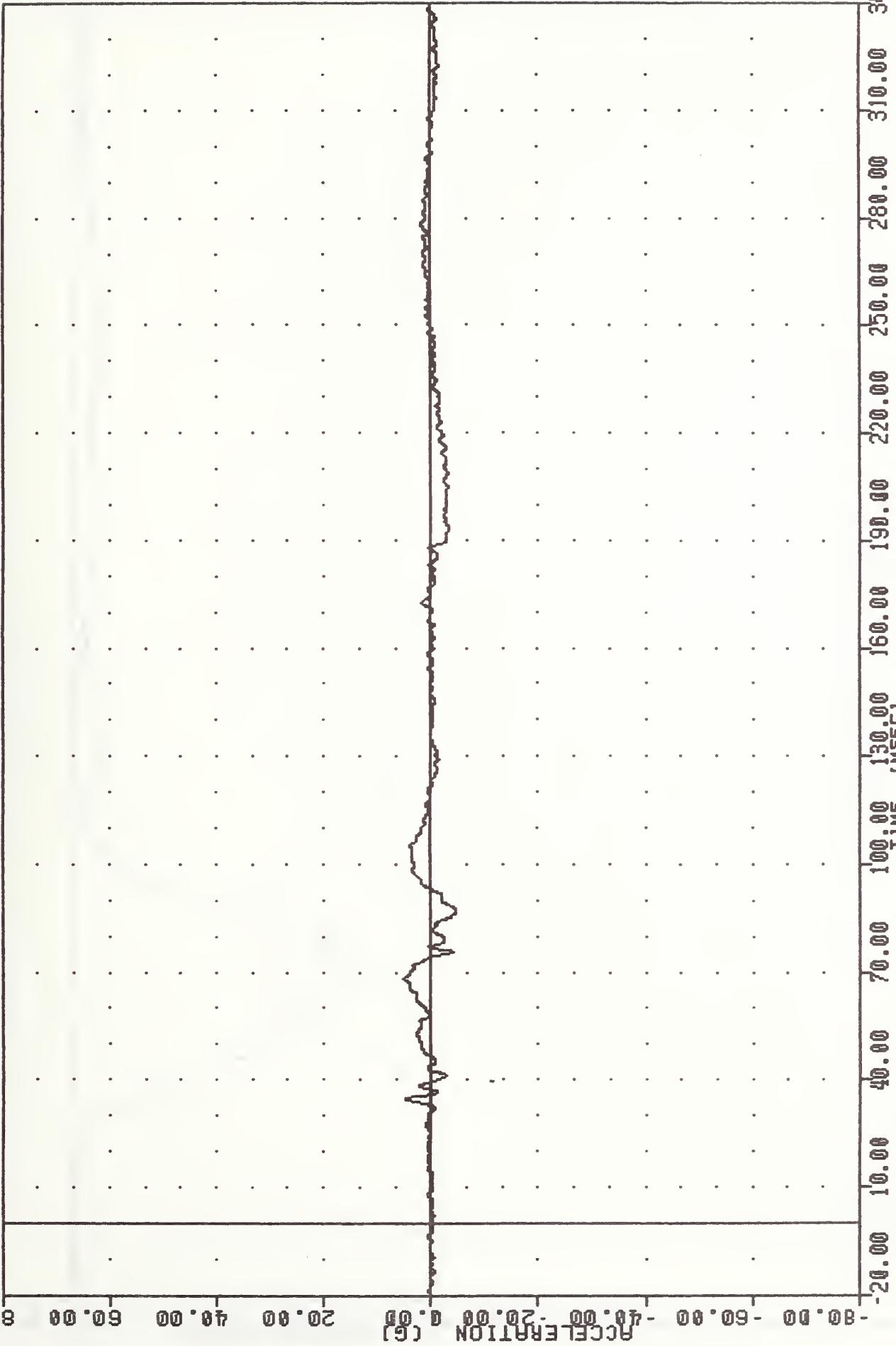
FILTER = BLPP 300/-750/-16
MIN. MAX VALUES = -6.188 79.38 , 3.57 & 53.13



FORD ESCORT INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION

TRC 871216
200 FRONTAL CRASH TEST
87350
CSTZG1

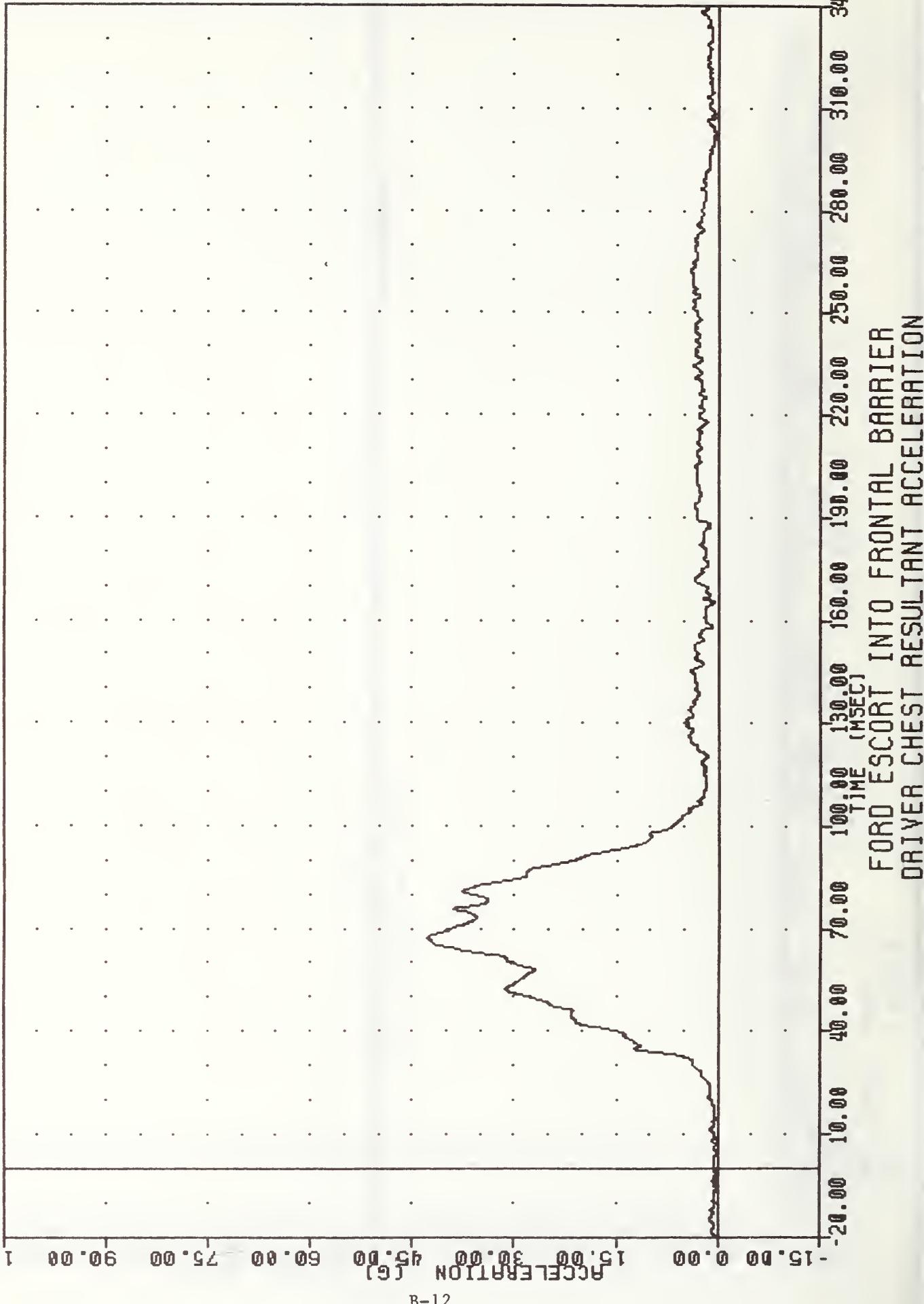
FILTER = BLPP 300/ 750/-16
MIN, MAX VALUES = -4.588 86.88 , 5.09 & 68.25



FORD ESCORT INTO FRONTAL BARRIER
DRIVER CHEST Z AXIS ACCELERATION

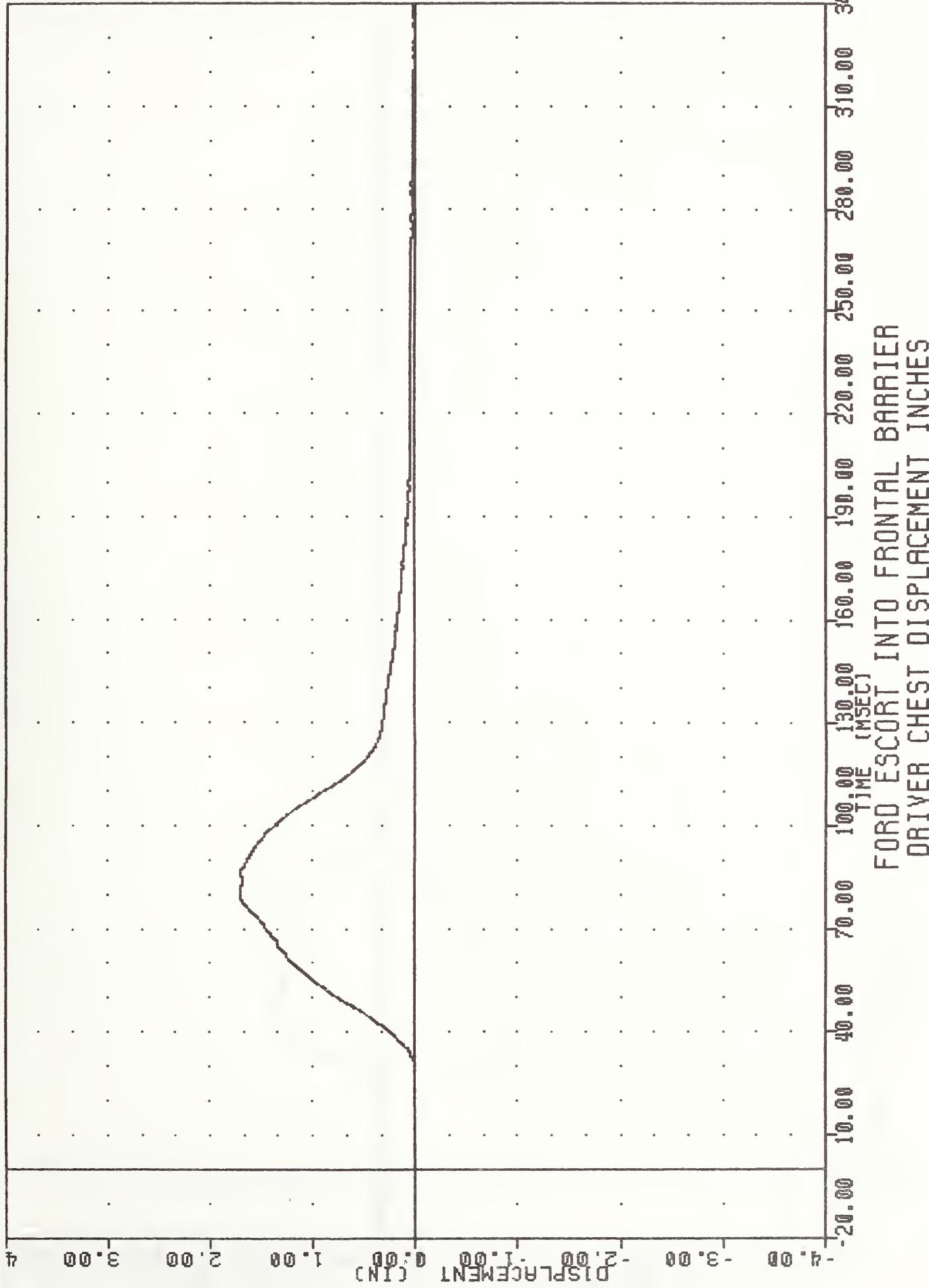
TRC 871216
2008 FRONTAL CRASH TEST
87350
CSTRG1

FILTER = BLPP 3000/ 750/-16
MIN, MAX VALUES = 0.068 -3.00 -42.75 67.25



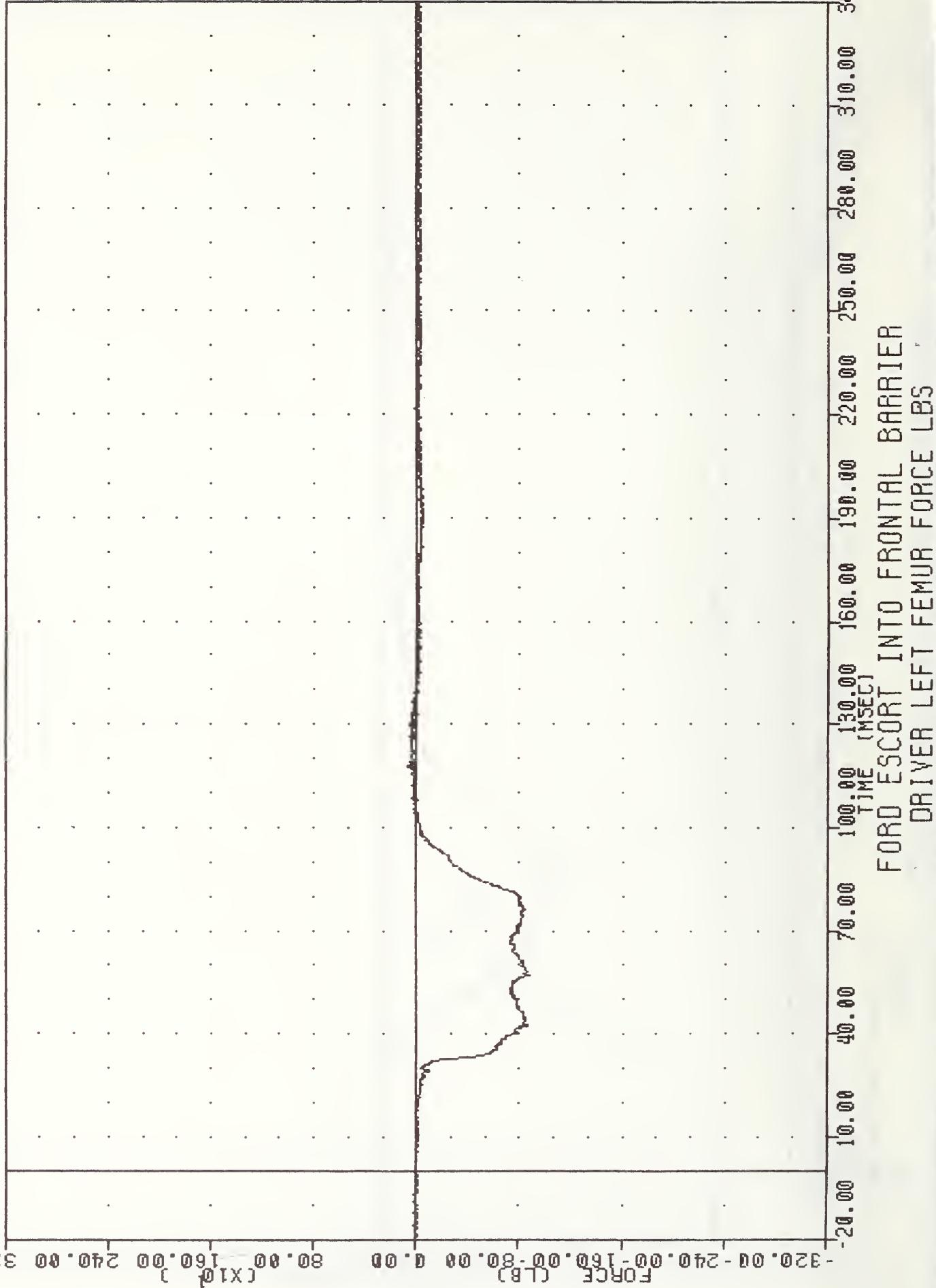
TRC , 871216
200 FRONTAL CRASH TEST
87350
CSTX01

FILTER = BLPP 300/ 750/-16
MIN, MAX VALUES = 0.000 25.50 ,
1.71 e 86.13



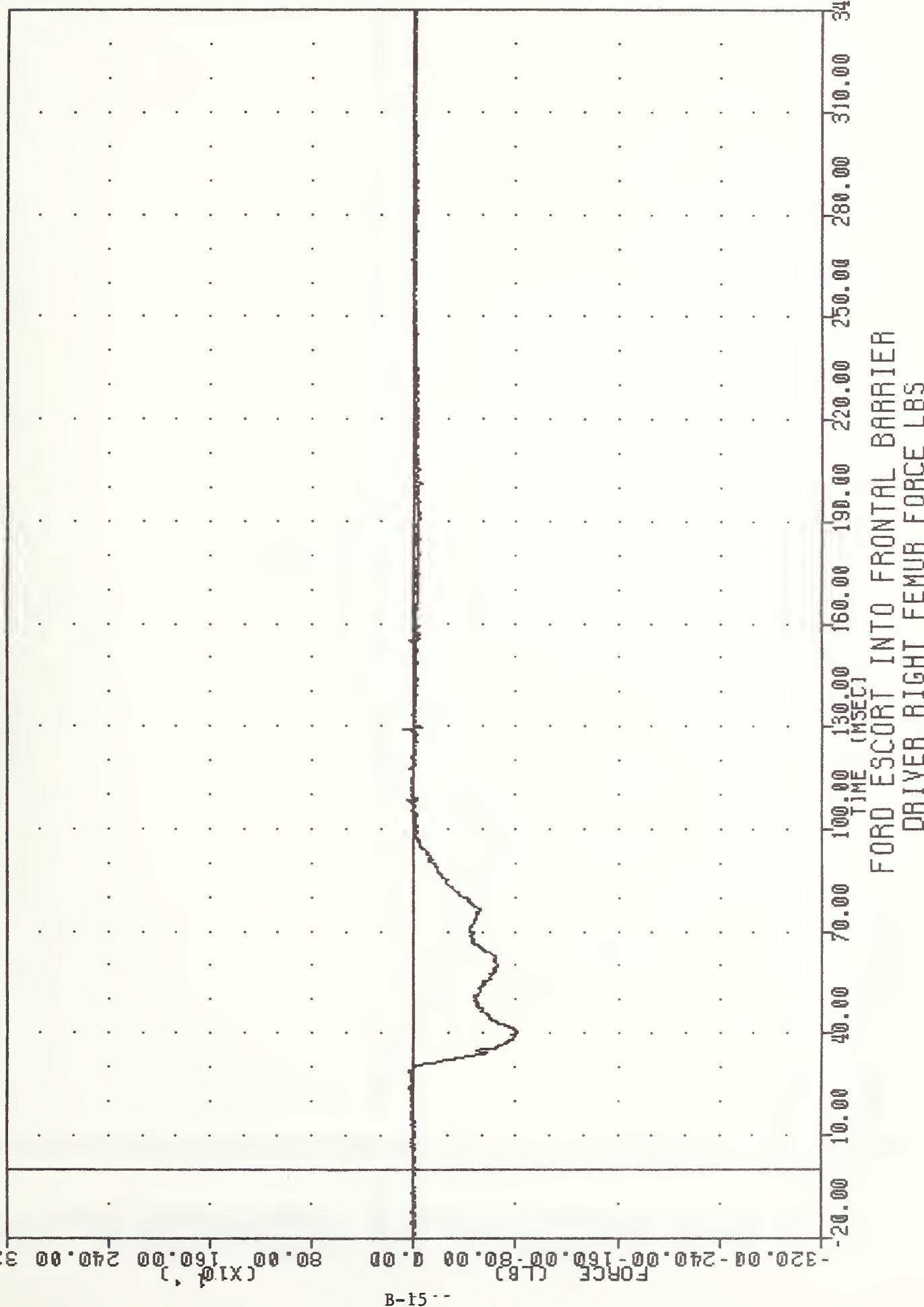
TRC 871216
209 FRONTAL CRASH TEST
87350
LFMF1

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -872.08 & 57.13 , 73.88 & 117.63



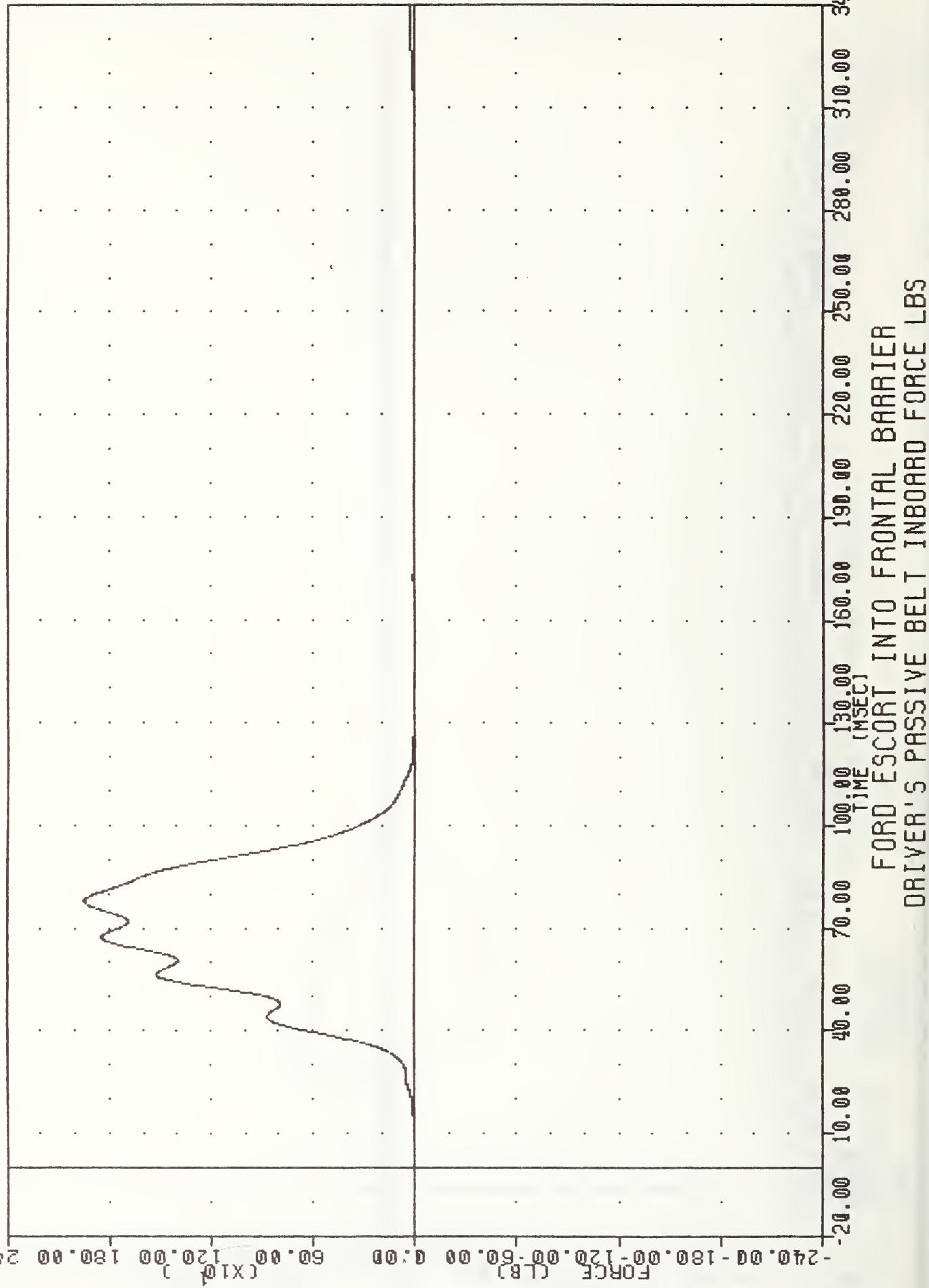
TRC • 871216
208 FRONTAL CRASH TEST
87350
RFMF1

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -807.828 40.25 , 89.62 & 129.00



TRC 871216
208 FRONTAL CRASH TEST
87350
SHBF1

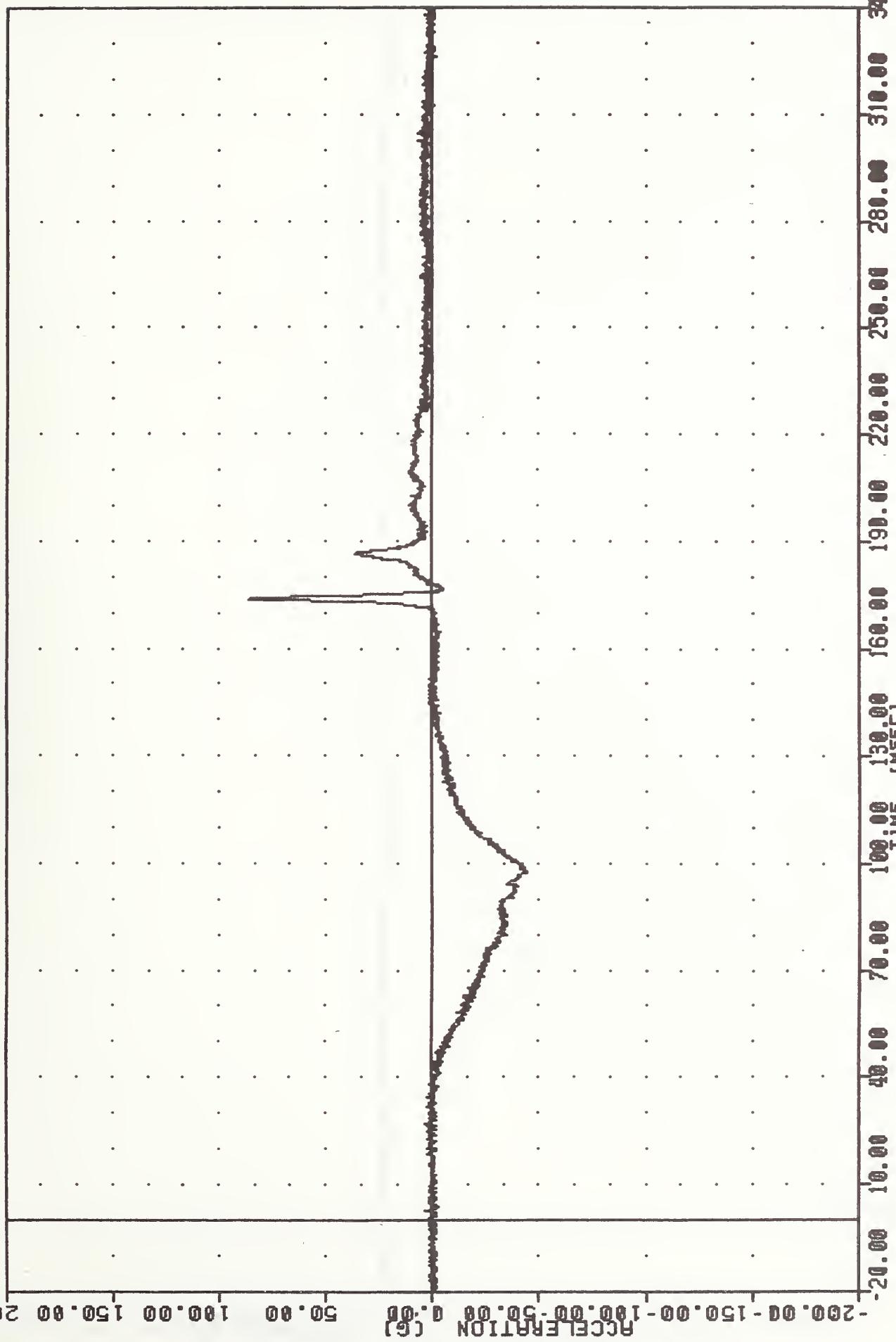
FILTER = BLPP 100/-250/-16
MIN, MAX VALUES = -1.81@ 262.88 , 1945.10 @ 77.88



FORD ESCORT INTO FRONTAL BARRIER
DRIVER'S PASSIVE BELT INBOARD FORCE LBS

TRC 871216
2000 FRONTAL CRASH TEST
87350 HEDGXG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -44.268 97.38 . 86.01 e 173.75

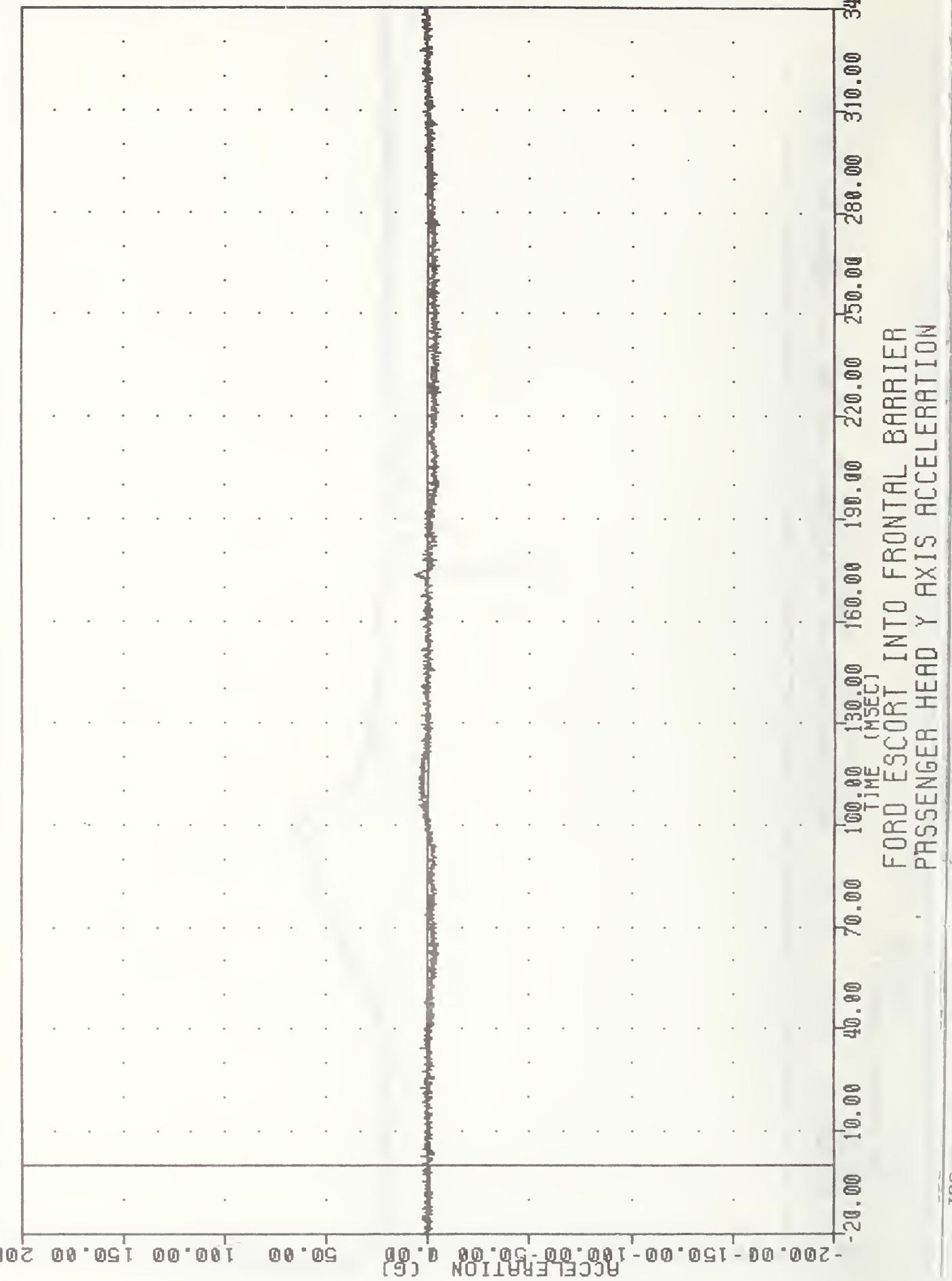


FORD ESCORT INTO FRONTAL BARRIER
PASSENGER HEAD X AXIS ACCELERATION

TRC , 871216
208 FRONTAL CRASH TEST

87350
HEDY62

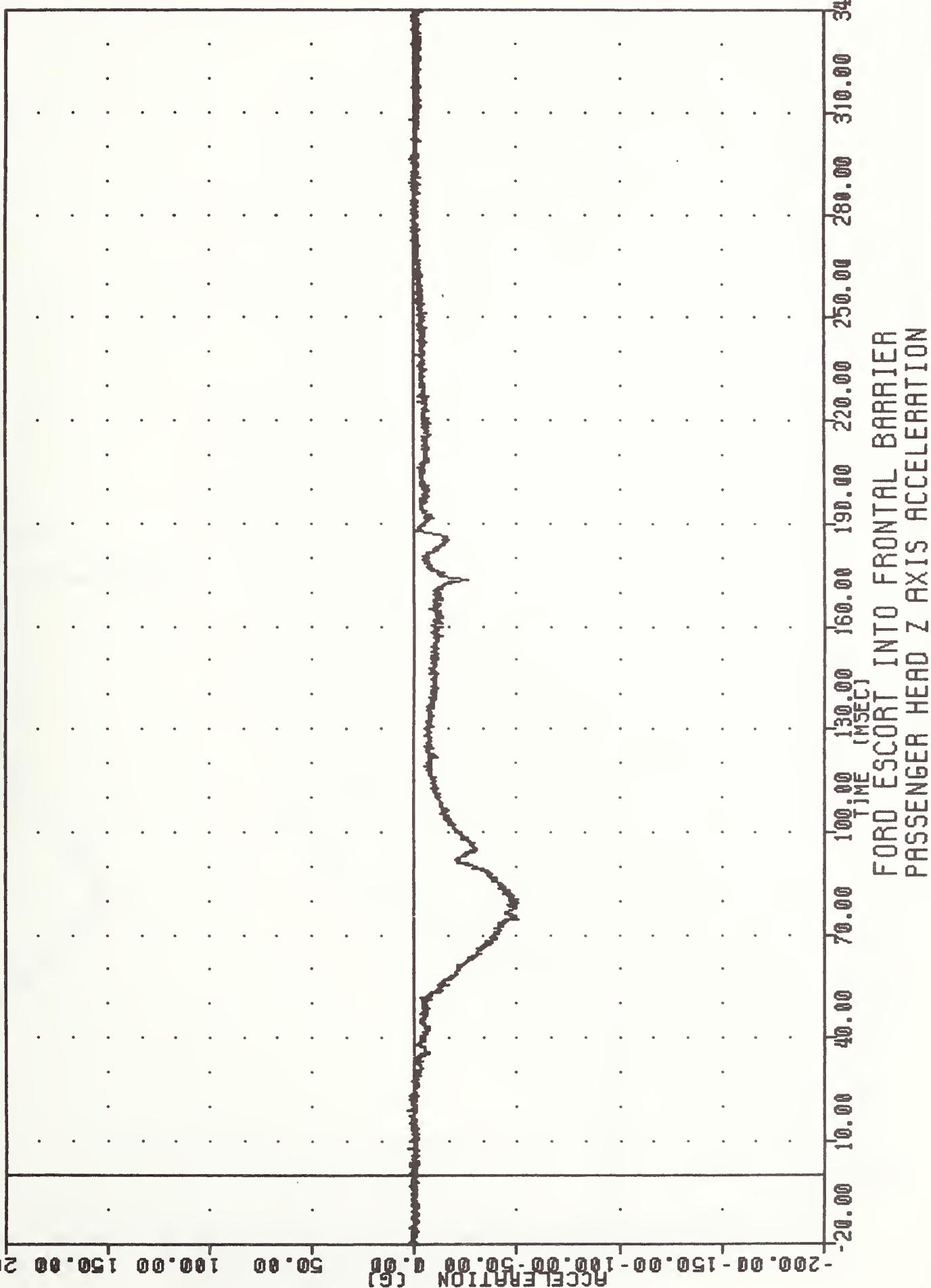
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MIN. MAX VALUES = -5.978 226.88 , 6.60 & 173.25



FORD ESCORT INTO FRONTAL BARRIER
PASSENGER HEAD Y AXIS ACCELERATION

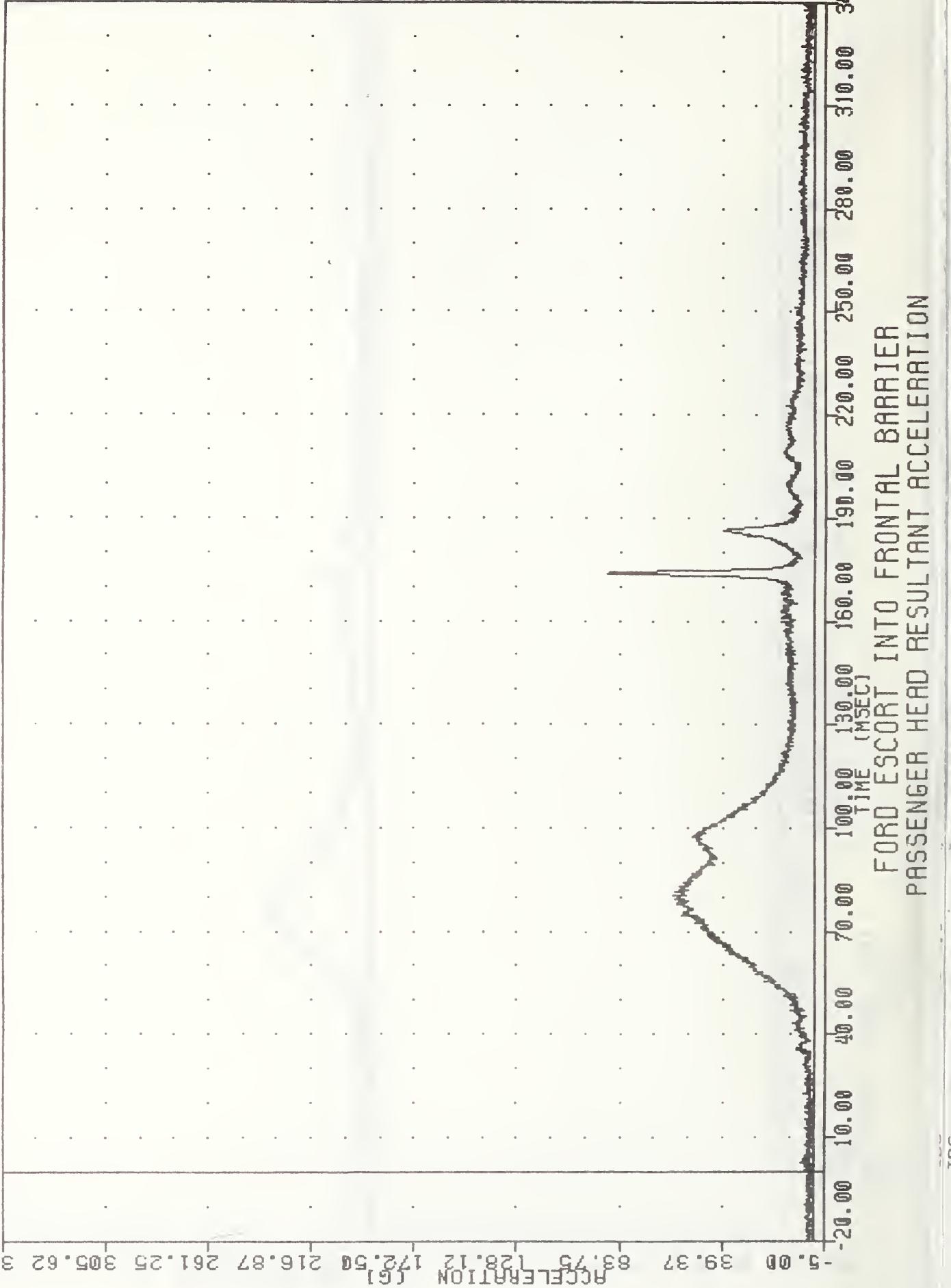
TRC , 871216
200 FRONTAL CRASH TEST
87350
HEDZ62

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3.26 e 8.00



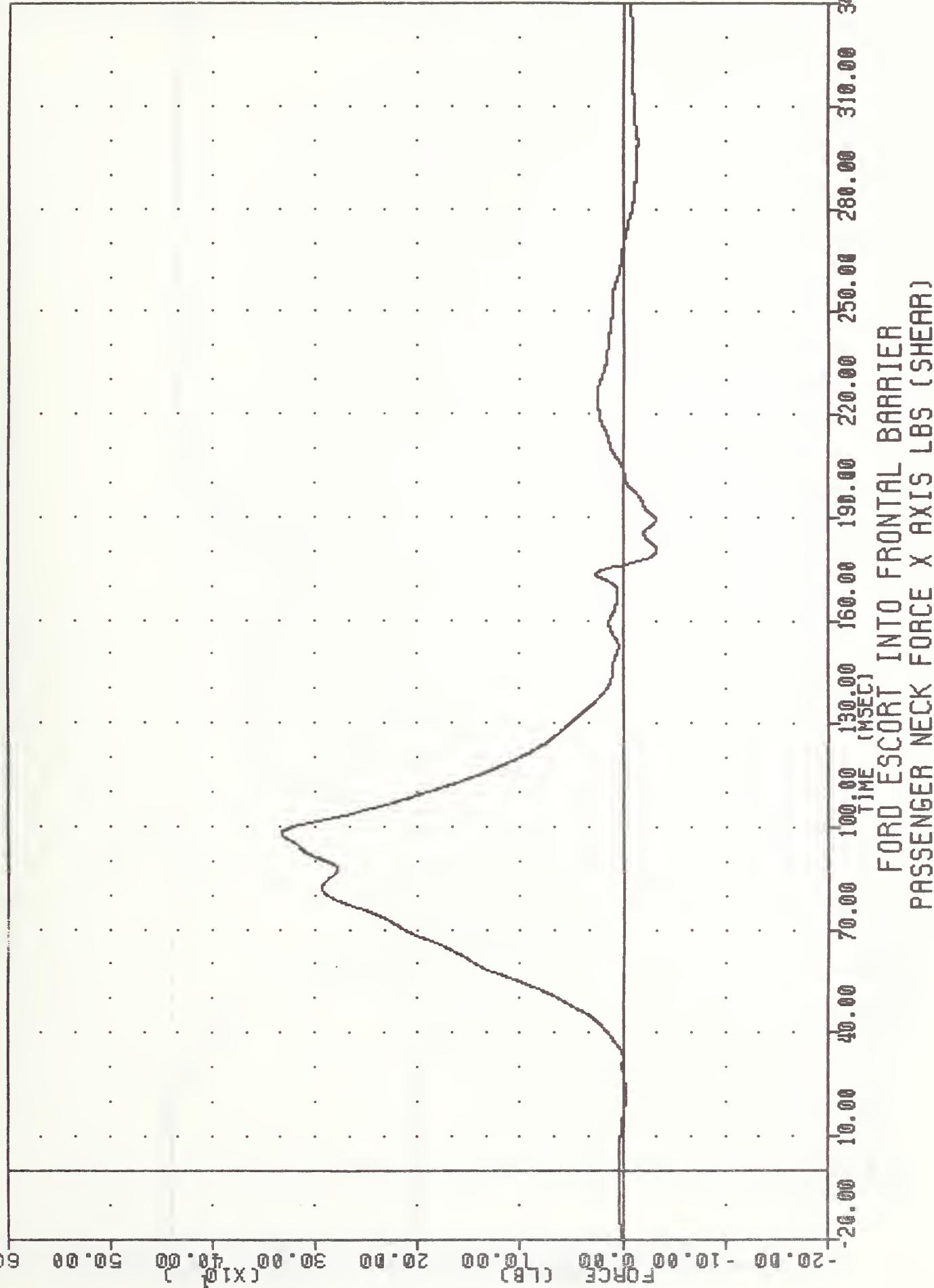
TRC 871216
208 FRONTAL CRASH TEST
87350 HEDRG2

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.308 11.38 89.26 8 173.75



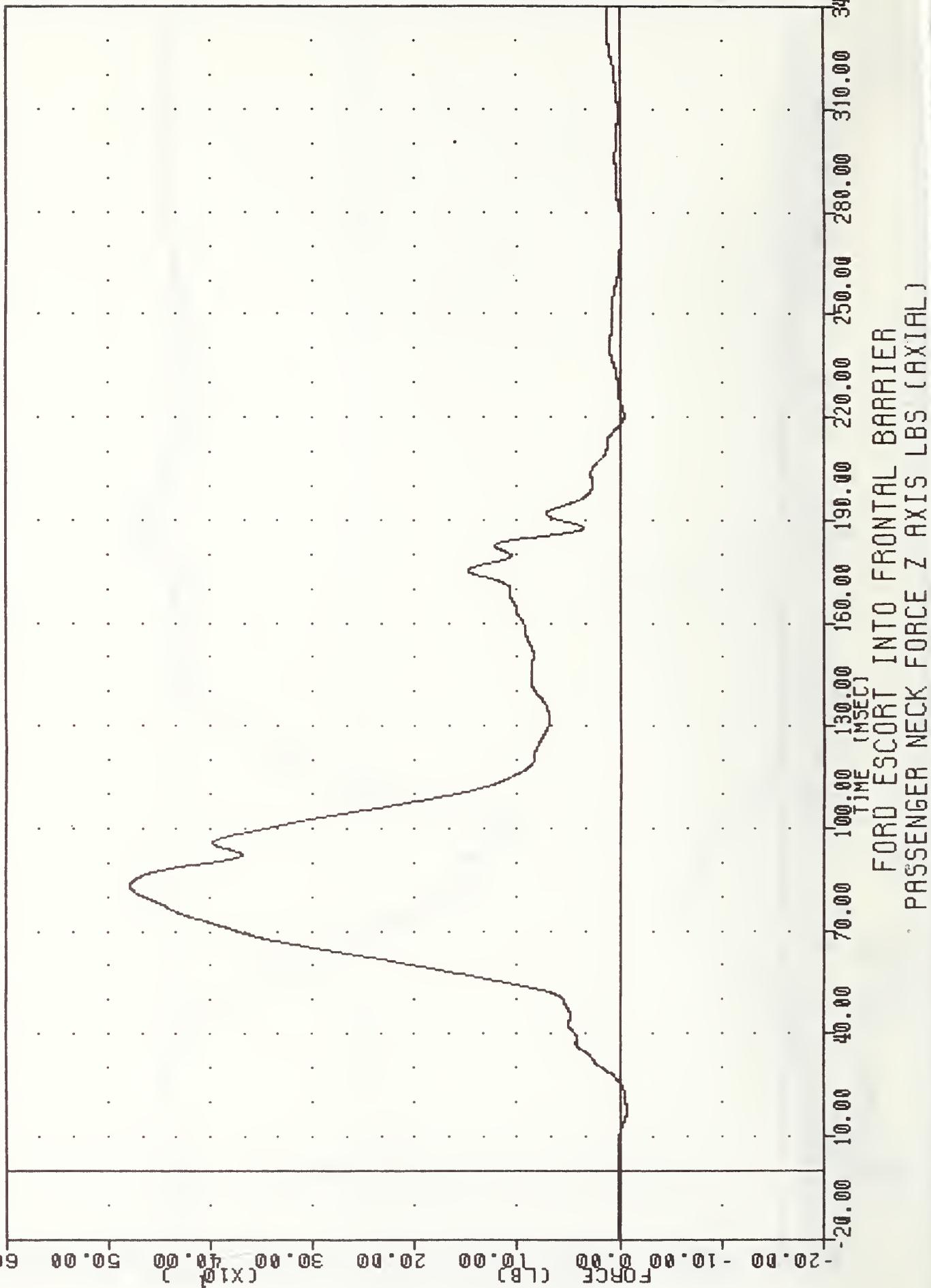
TRC • 871216
208 FRONTAL CRASH TEST
87350
NEKXF2

FILTER = BLPP 100/ 250/-16
MIN. MAX VALUES = -33.528 180.25 , 333.00 & 98.00



TRC , 871216
2000 FRONTAL CRASH TEST
87350
NEKZF2

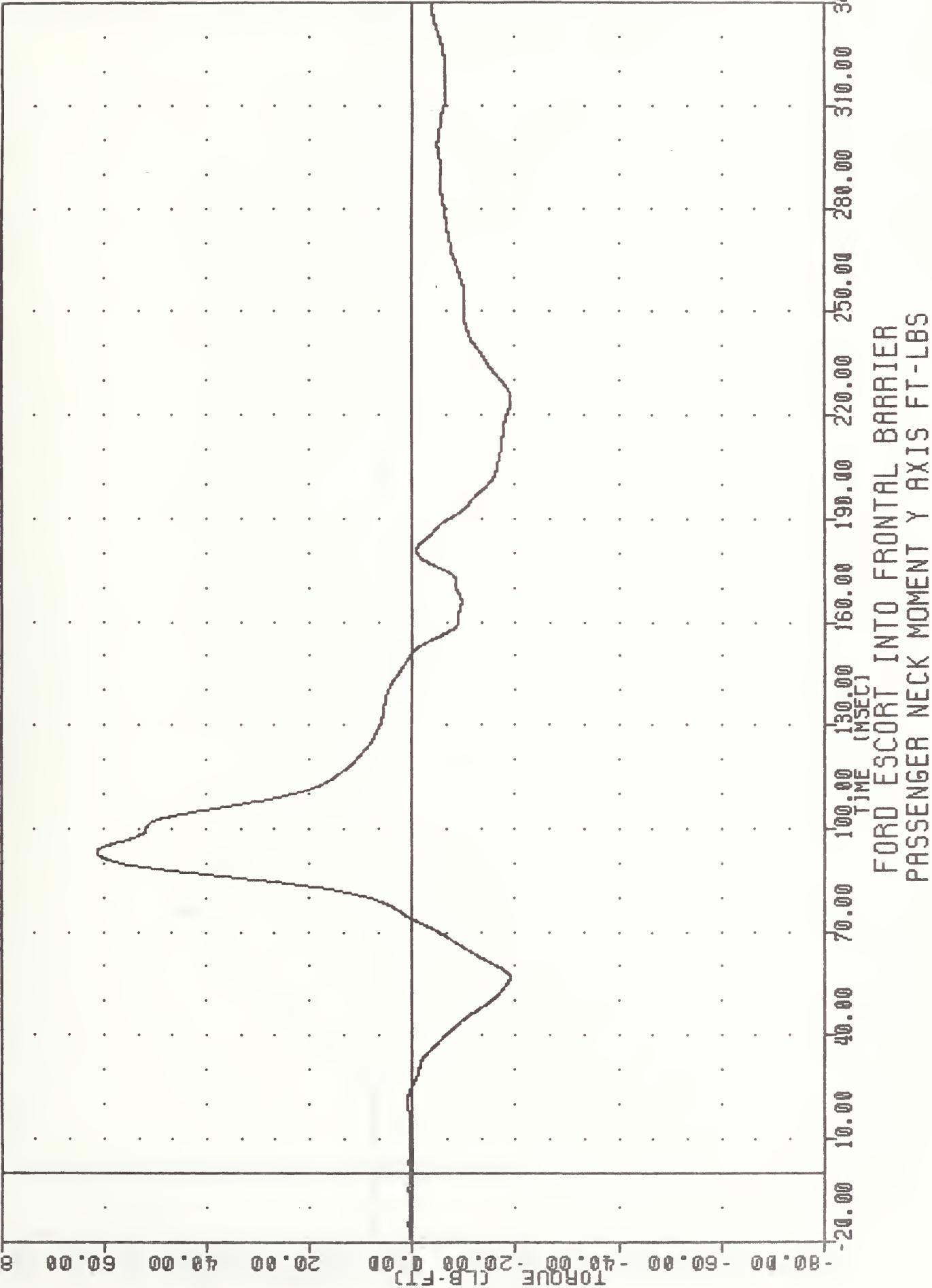
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -7.488 17.50 , 478.02 & 83.25



FORD ESCORT INTO FRONTAL BARRIER
PASSENGER NECK FORCE Z AXIS LBS (AXIAL)

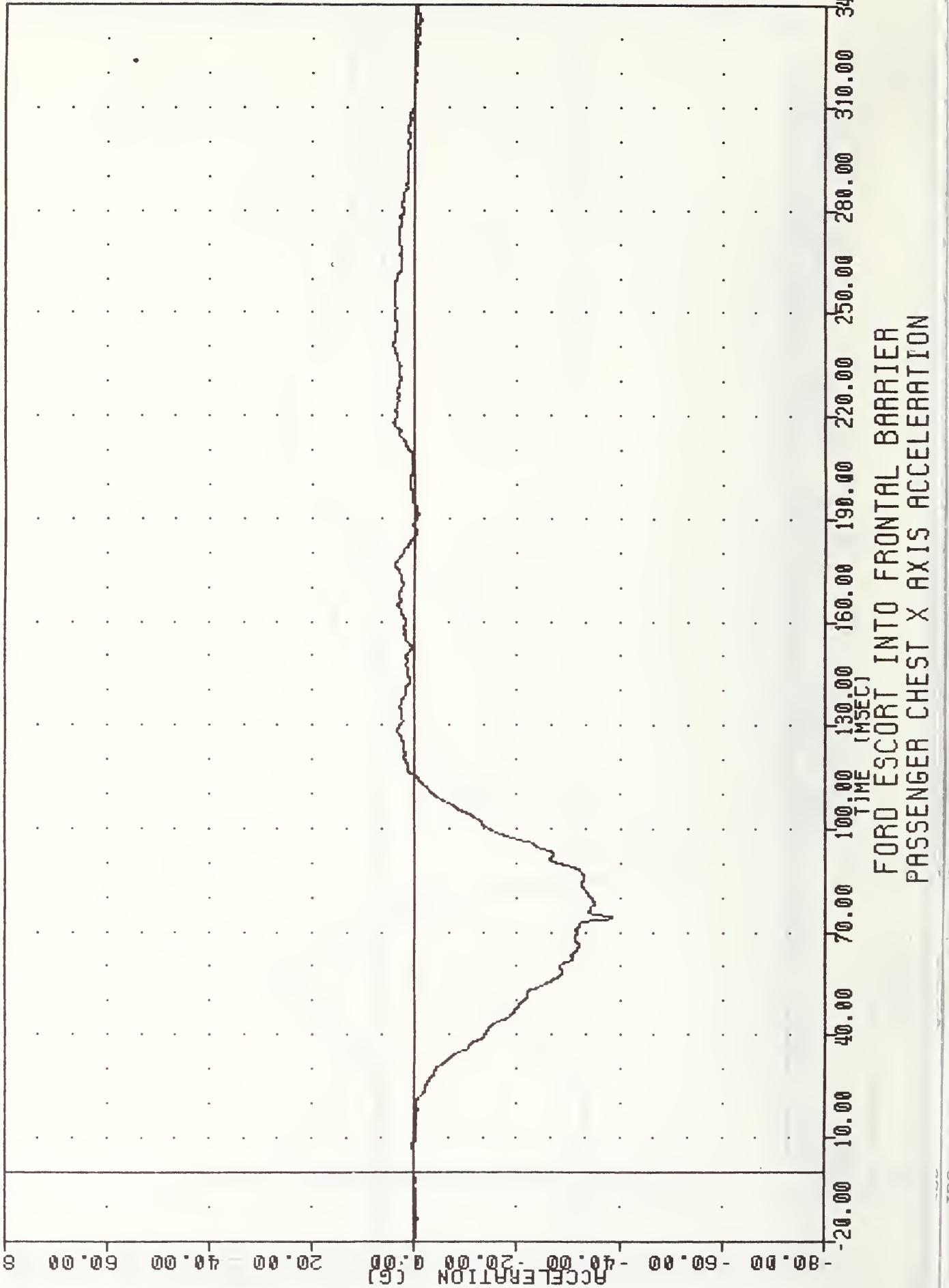
TRC • 871216
200 FRONTAL CRASH TEST
87350
NEKYM2

FILTER = BLPP 100/-250/-16
MIN. MAX VALUES = -19.108 224.75 .
61.34 e 93.25



TRC 871216
2008 FRONTAL CRASH TEST
97350
CSTXG2

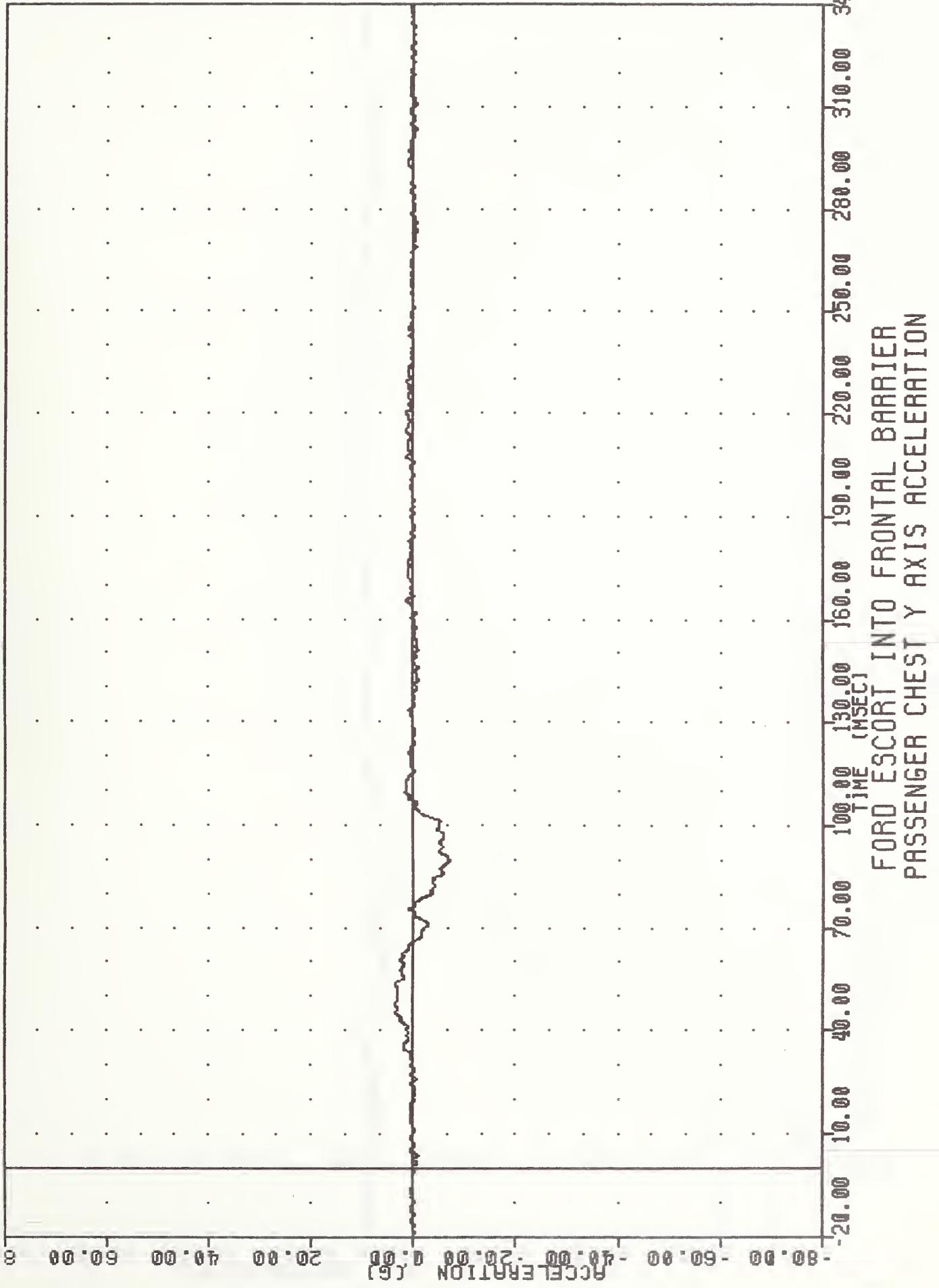
FILTER = BLPP 3000/ 750/ -16
MIN, MAX VALUES = -38.668 74.25 , 4.32 & 240.63



TRC 871216
208 FRONTAL CRASH TEST
87350 CSTY62

FILTER = BLPP 3000/ 750/-16
MIN, MAX VALUES = -7.078 89.50 .

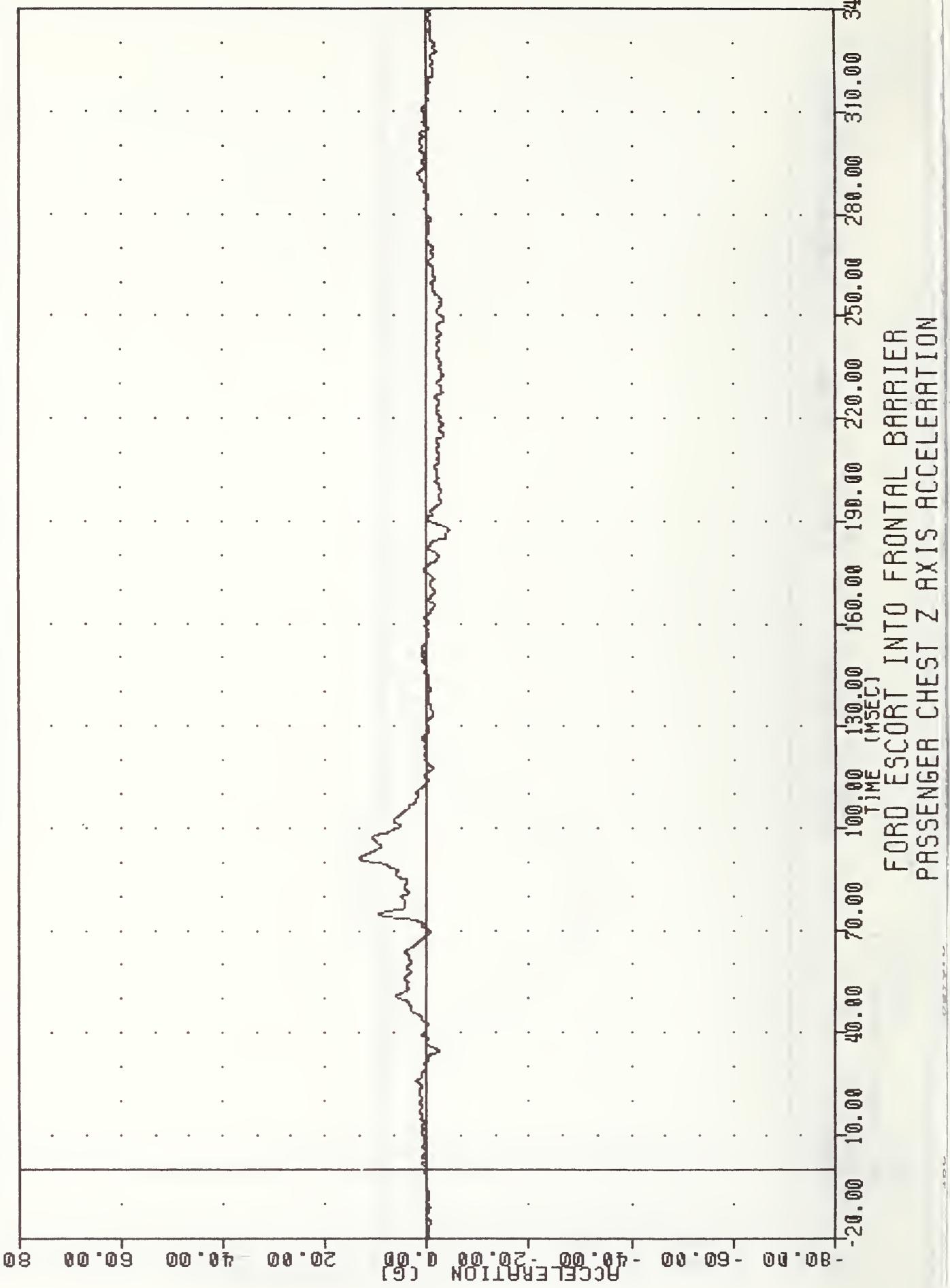
3.55 @ 53.75



FORD ESCORT INTO FRONTAL BARRIER
PASSENGER CHEST Y AXIS ACCELERATION

TRC , 871216
200 FRONTAL CRASH TEST
8735@
CSTZ62

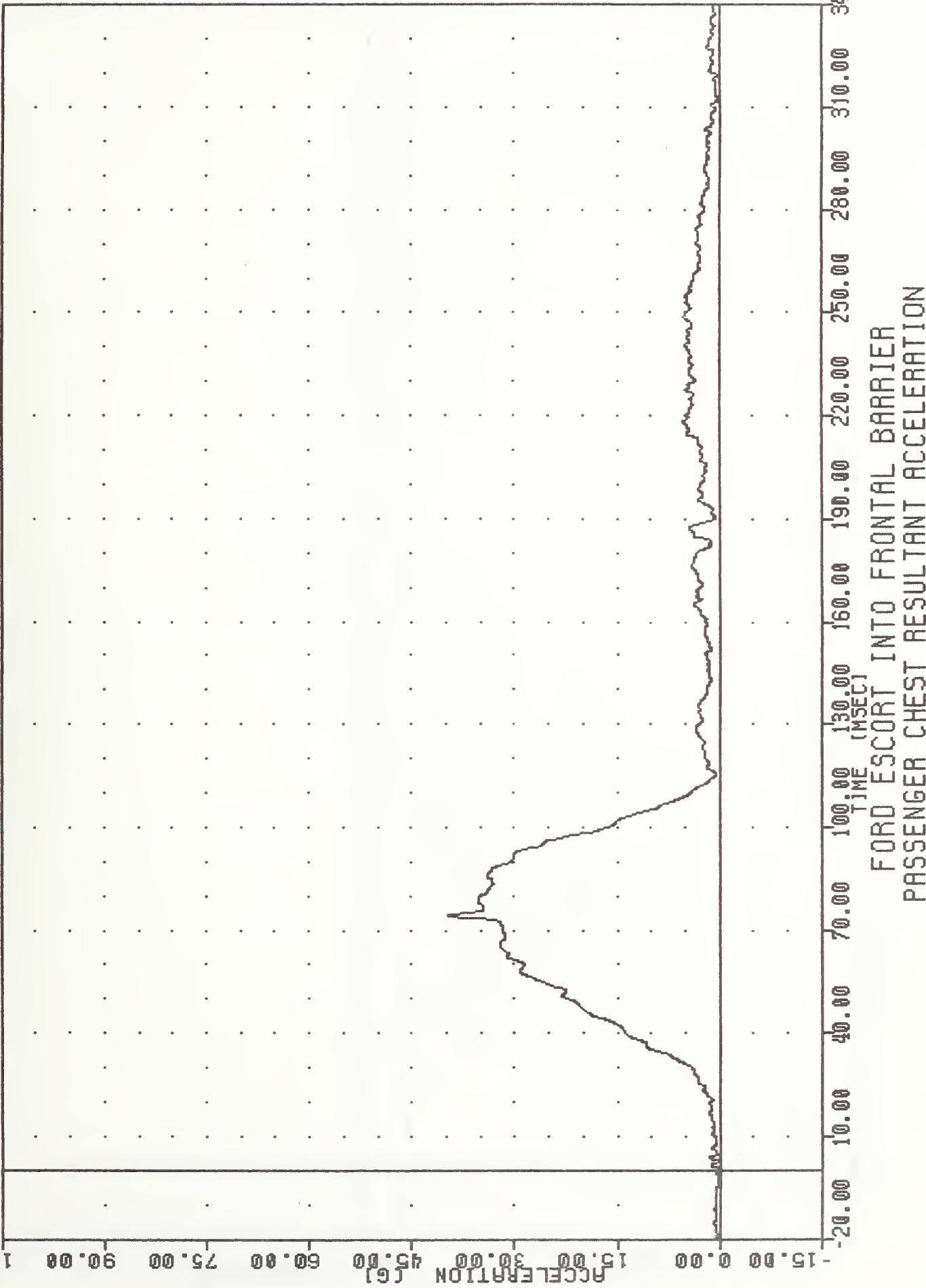
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -4.41@ 187.38 , 13.21 @ 91.13



FORD ESCORT INTO FRONTAL BARRIER
PASSENGER CHEST Z AXIS ACCELERATION

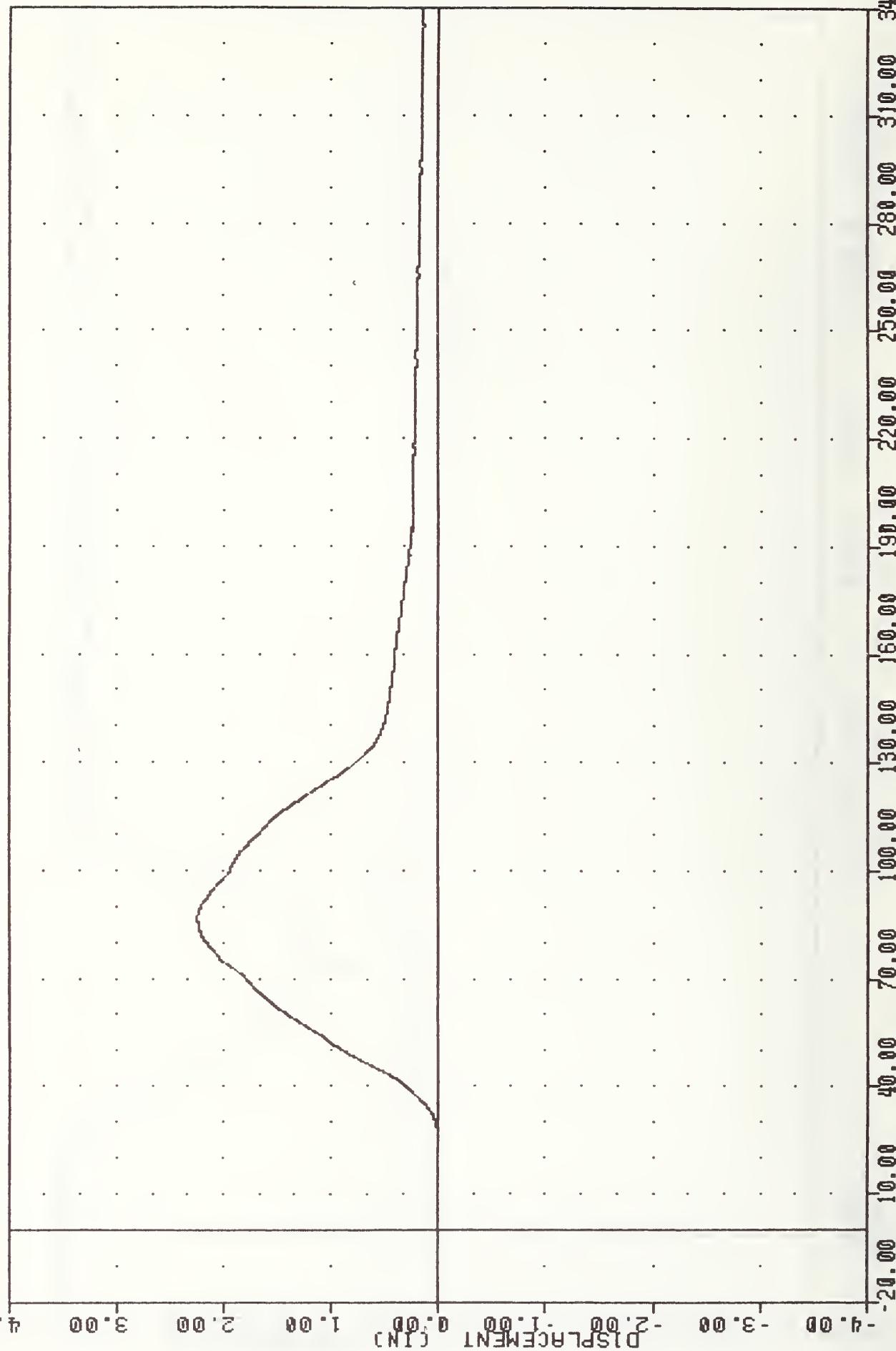
TRC
871216
208 FRONTAL CRASH TEST
87350
CSTRG2

FILTER = BLPP 300/ 750/-16
MIN, MAX VALUES = 0.088 -20.00 , 39.60 e 74.25



TRC 871216
200 FRONTAL CRASH TEST
87350
CSTX02

FILTER = BLPP 3000/ 750/ -16
MIN, MAX VALUES = -0.018 -13.38 , 2.25 & 86.50

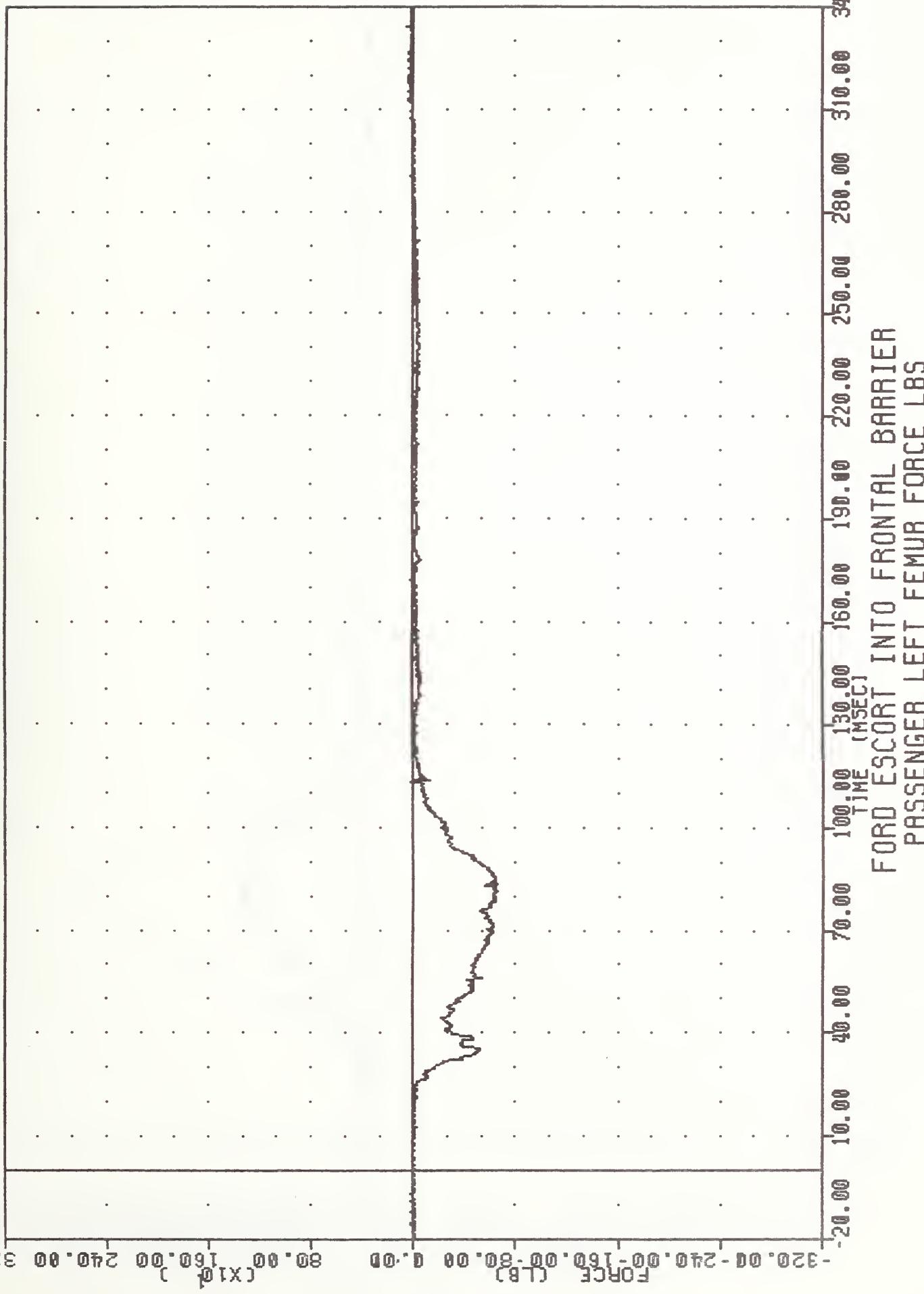


FORD ESCORT INTO FRONTAL BARRIER
PASSENGER CHEST DISPLACEMENT INCHES

TRC 871216

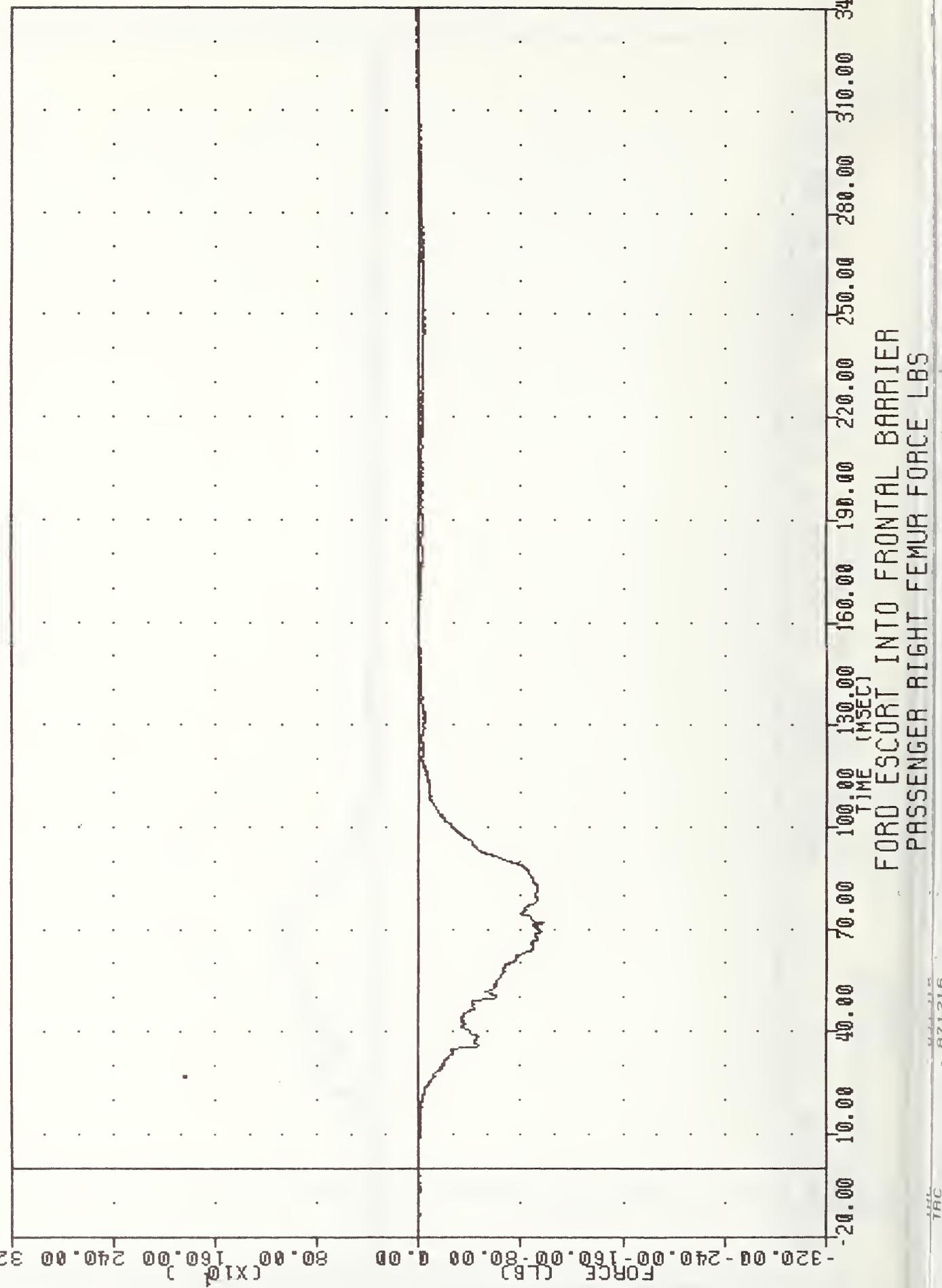
TRC , 871216
2008 FRONTAL CRASH TEST
87350
LFMF2

FILTER = BLPP 1000/ 2500/-16
MIN. MAX VALUES = -654.538 83.75 . 47.52 6 334.50



TRC 871216
208 FRONTAL CRASH TEST
87350
RFMF2

FILTER = BLPP 1000/ 2500/ -16
MIN. MAX VALUES = -976.538 71.75 ,
23.85 & 326.13

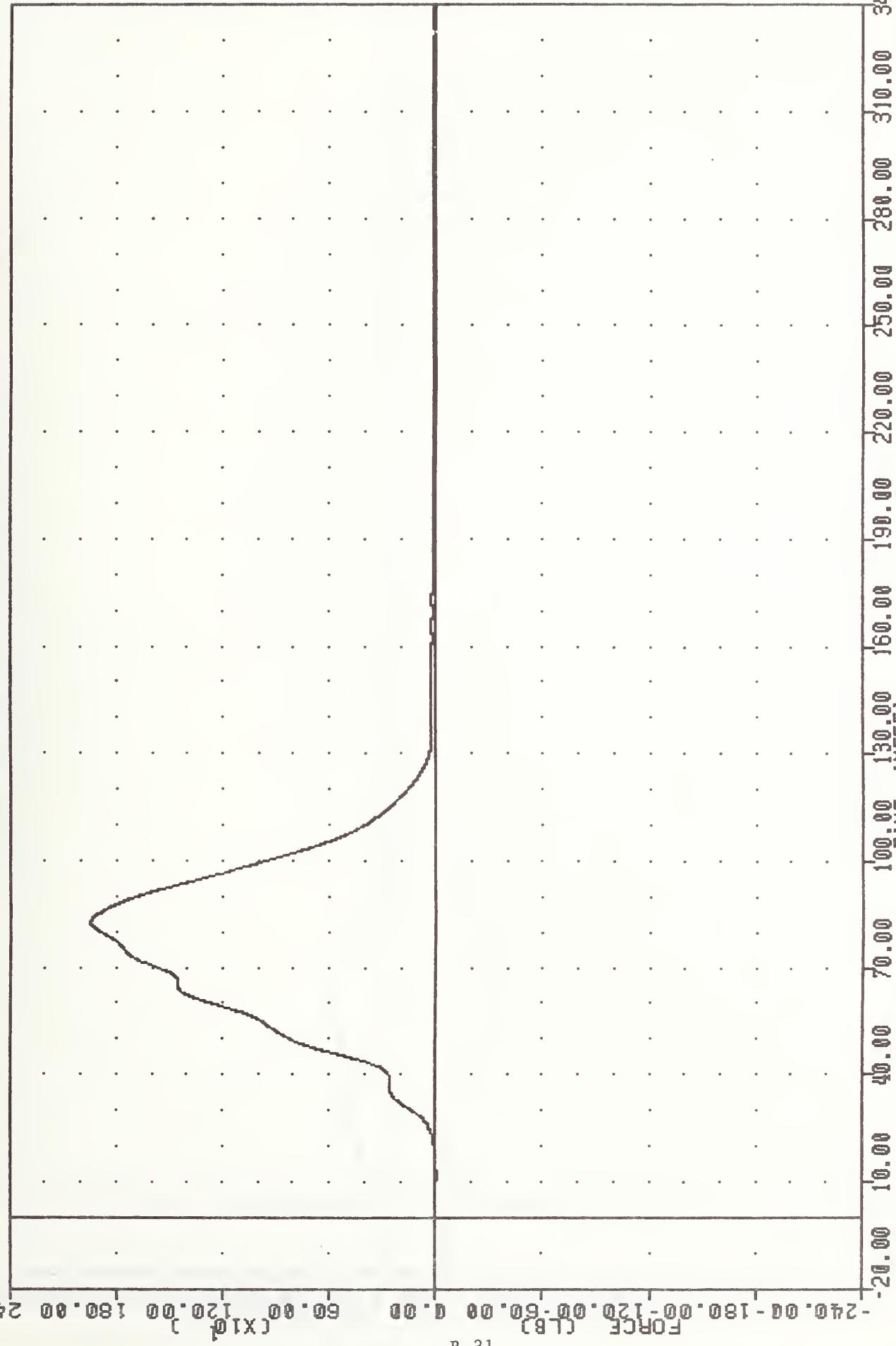


FOR ESCORT INTO FRONTAL BARRIER
PASSENGER RIGHT FEMUR FORCE LBS

TRC 871216

TRC • 871216
2008 FRONTAL CRASH TEST
87350
SHBF2

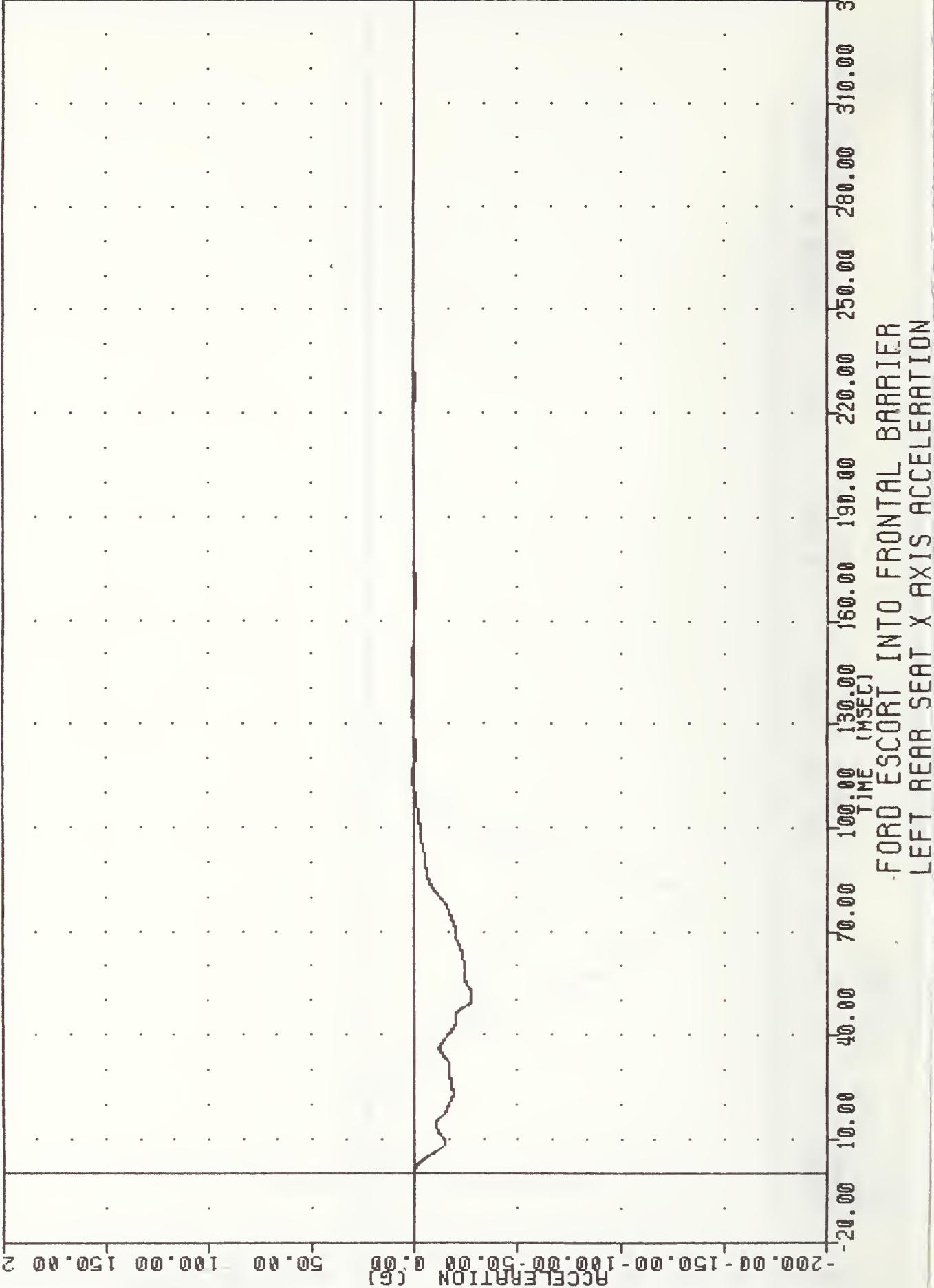
FILTER = BLPP 100/ 250/-16
MIN. MAX VALUES = -4.248 11.63 , 1946.20 e 82.63



TIME (msec)
FORD ESCORT INTO FRONTAL BARRIER
PASSENGER'S PASSIVE BELT INBOARD FORCE LBS

TRC 871216
208 FRONTAL CRASH TEST
87350 TLRXG1

FILTER = BLPP 100/ 250/-16
MIN. MAX VALUES = -27.558 50.50 , 1.32 @ 114.38



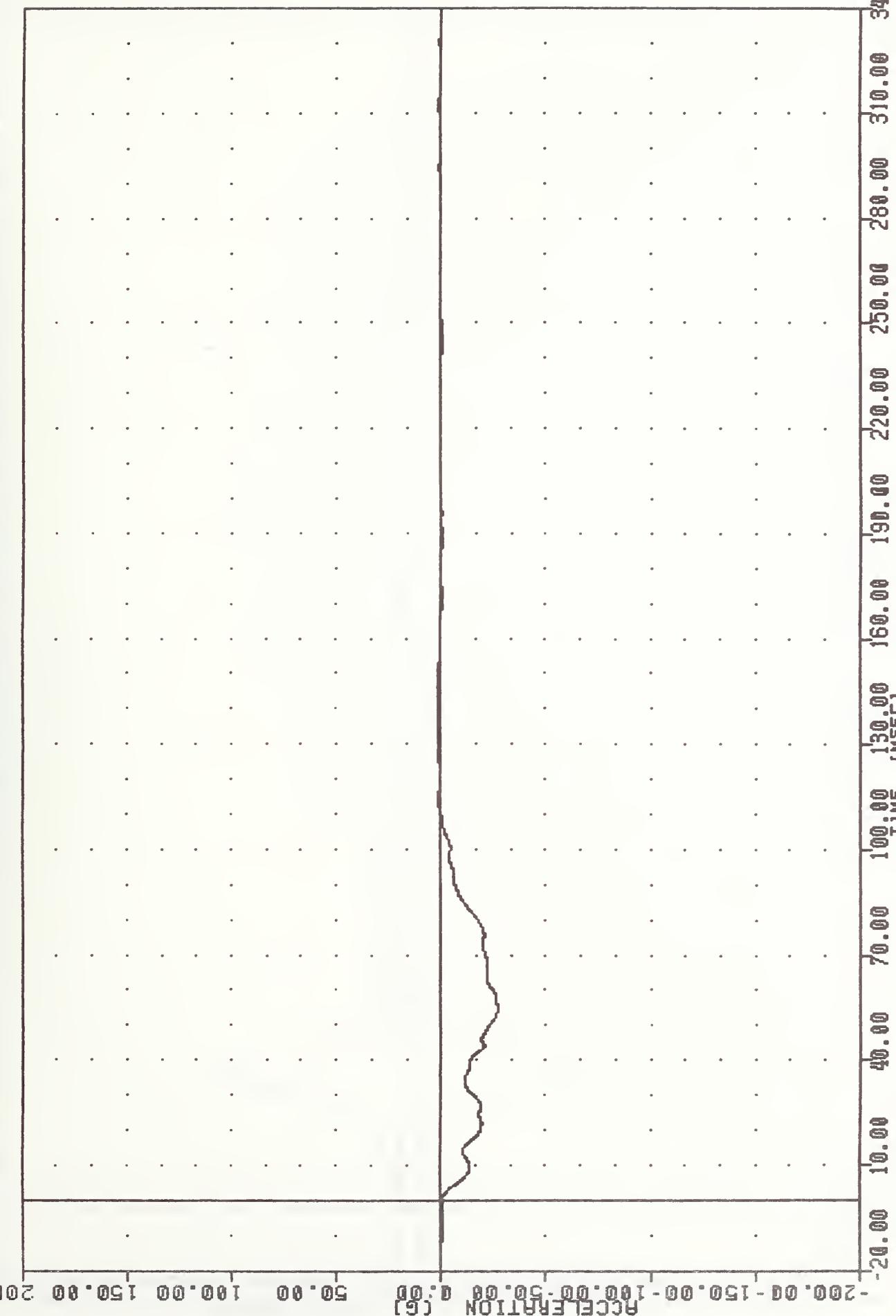
FORD ESCORT INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION

TRC 871216

TRC
208 FRONTAL CRASH TEST

87350
TRAXCI

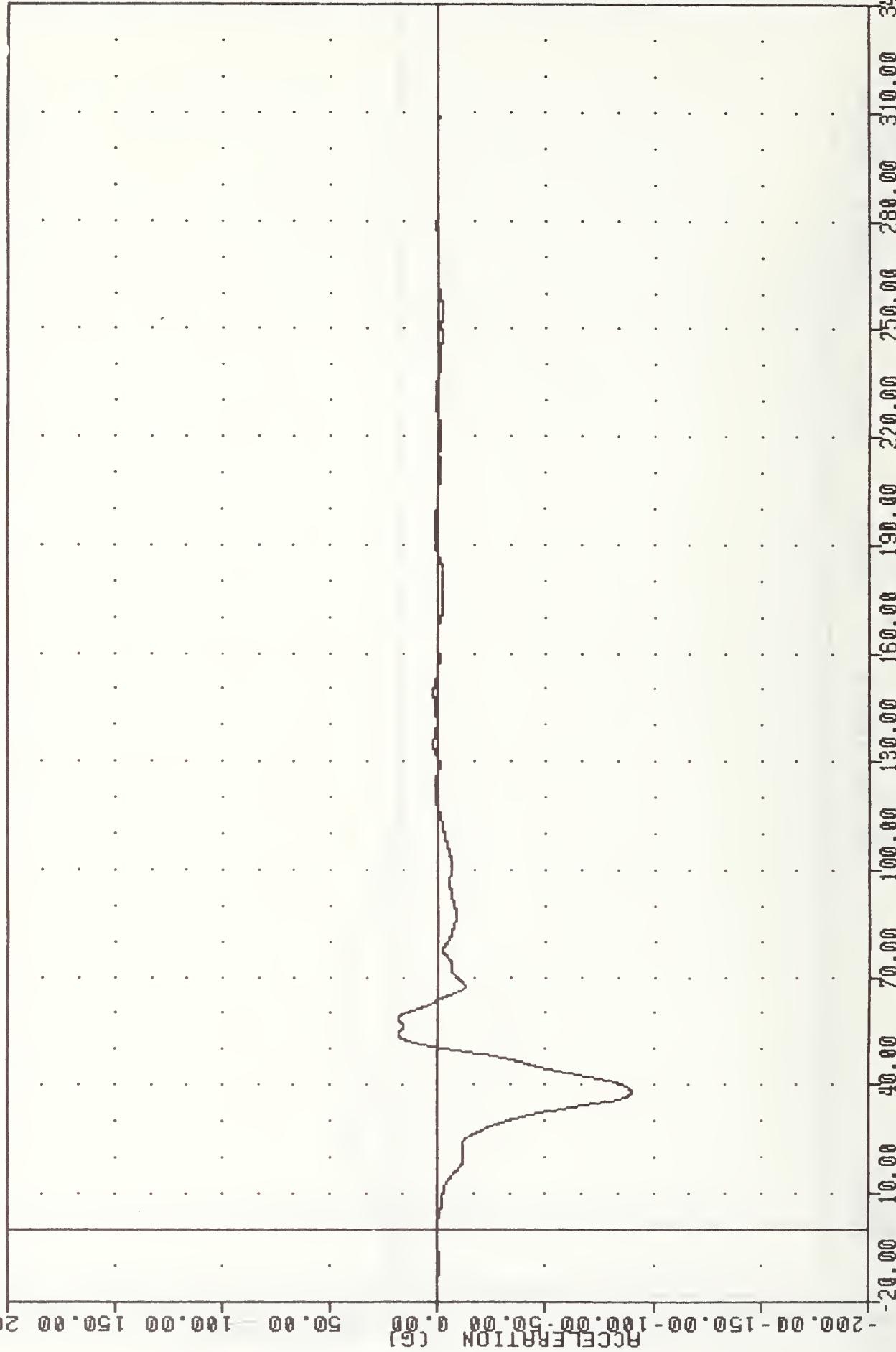
FILTER = BLPP 100/
MIN, MAX VALUES = -26.95 & 54.75 ,
1.69 & 135.00



FORD ESCORT INTO FRONTAL BARRIER
RIGHT REAR SEAT X AXIS ACCELERATION

TRC 871216
208 FRONTAL CRASH TEST
87350
ENGX61

FILTER = BLPP 100/-250/-16
MIN, MAX VALUES = -89.888 38.00
18.70 0 58.50

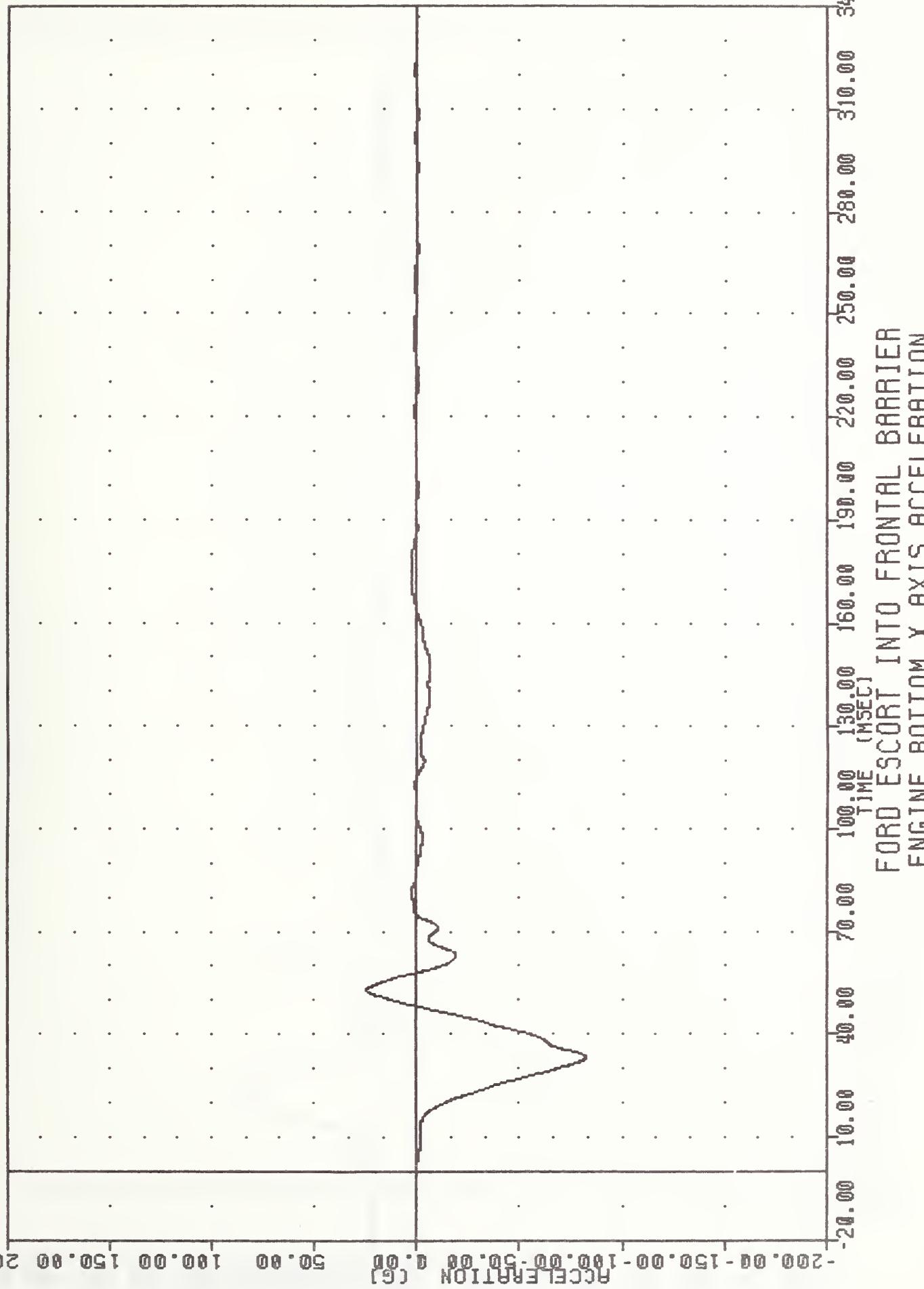


FORD ESCORT INTO FRONTAL BARRIER
ENGINE UPPER BLOCK X AXIS ACCELERATION

TRC 871216
2008 FRONTAL CRASH TEST
87350

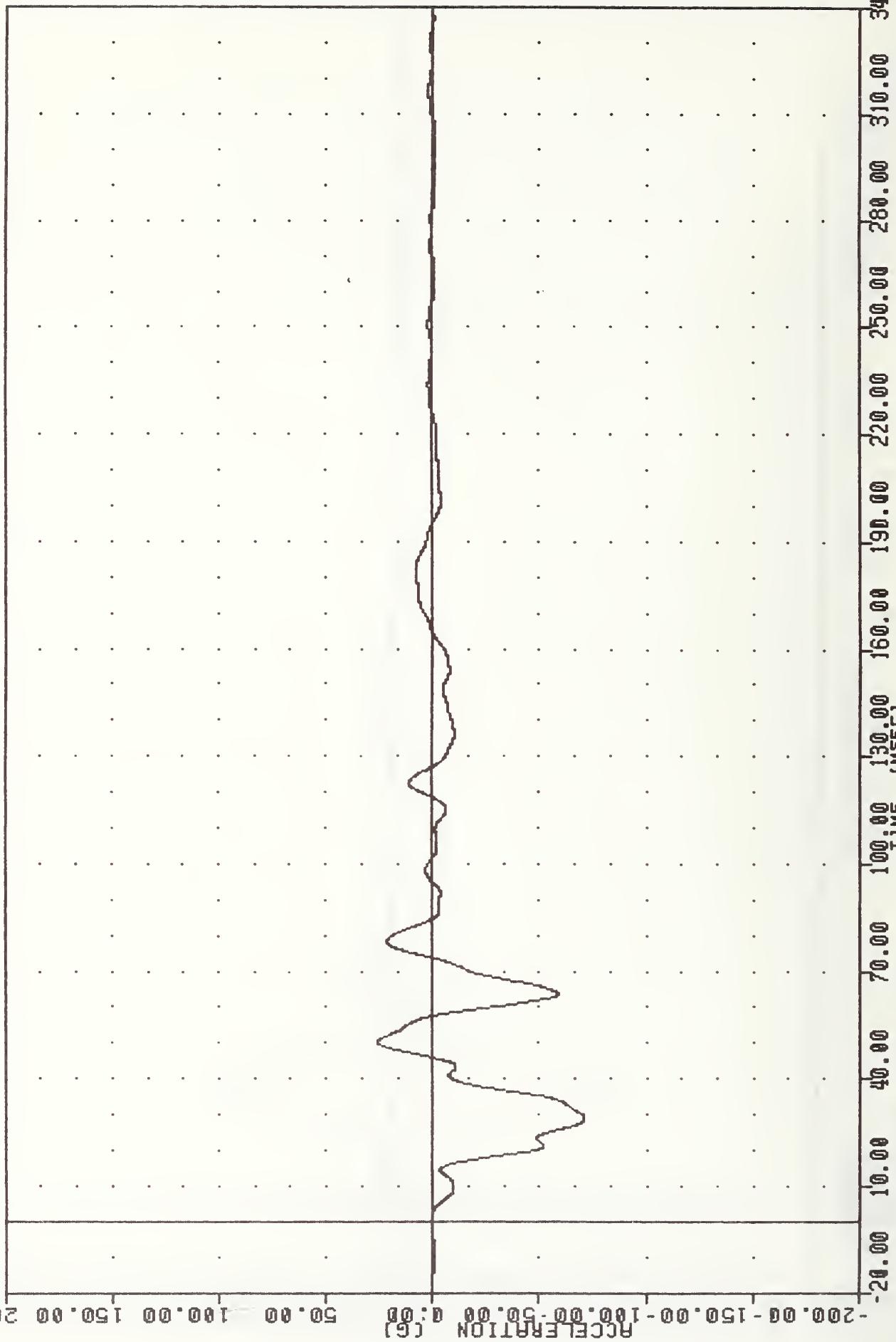
ENGXG2

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -82.818 33.25 , 24.62 & 53.00



TRC • 871216
208 FRONTAL CRASH TEST
87350
BCRXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -71.198 29.00 . 25.59 & 50.25



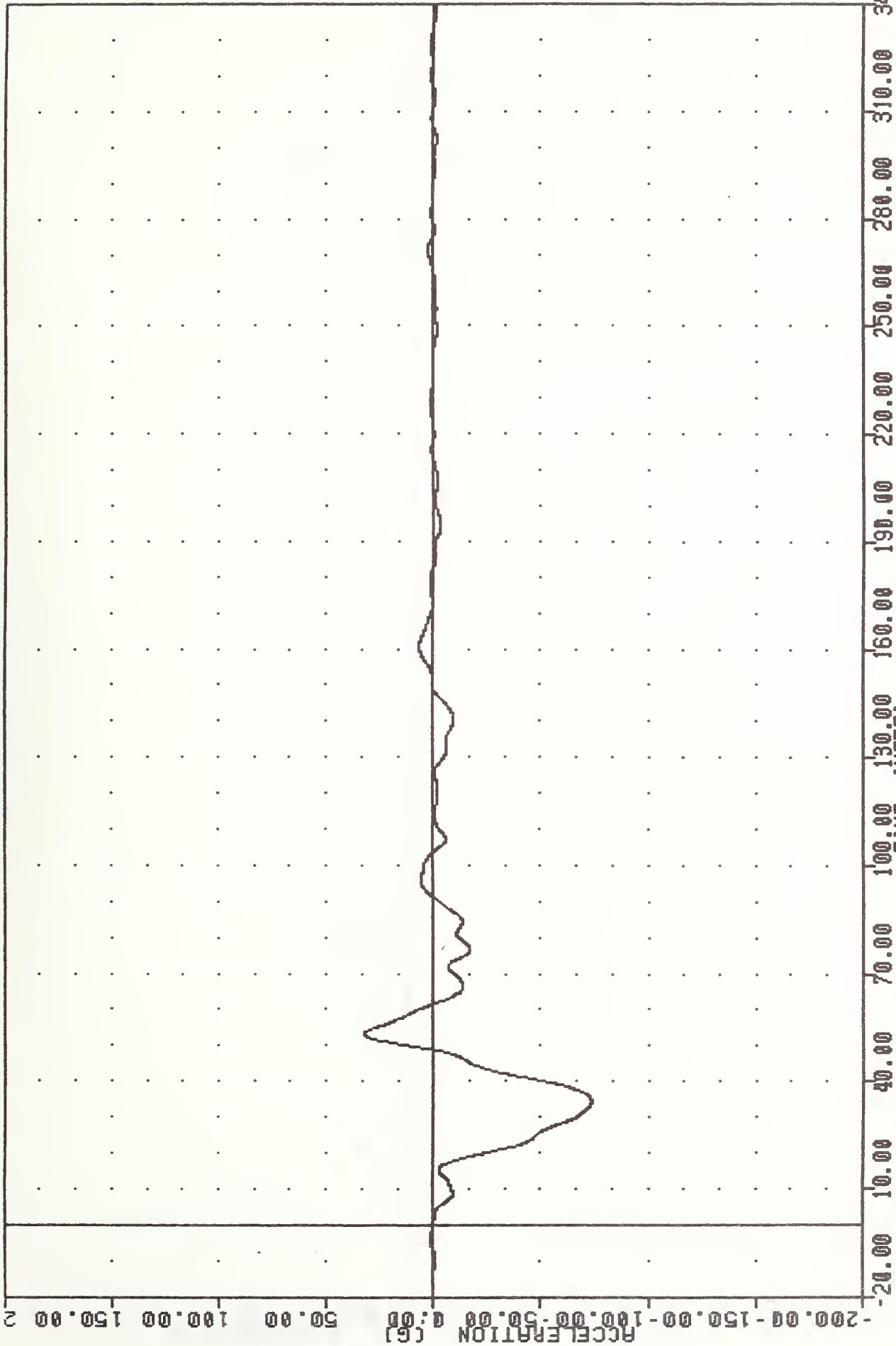
FORD ESCORT INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION

TRC • 871216

TRC
• 871216
200 FRONTAL CRASH TEST
87350

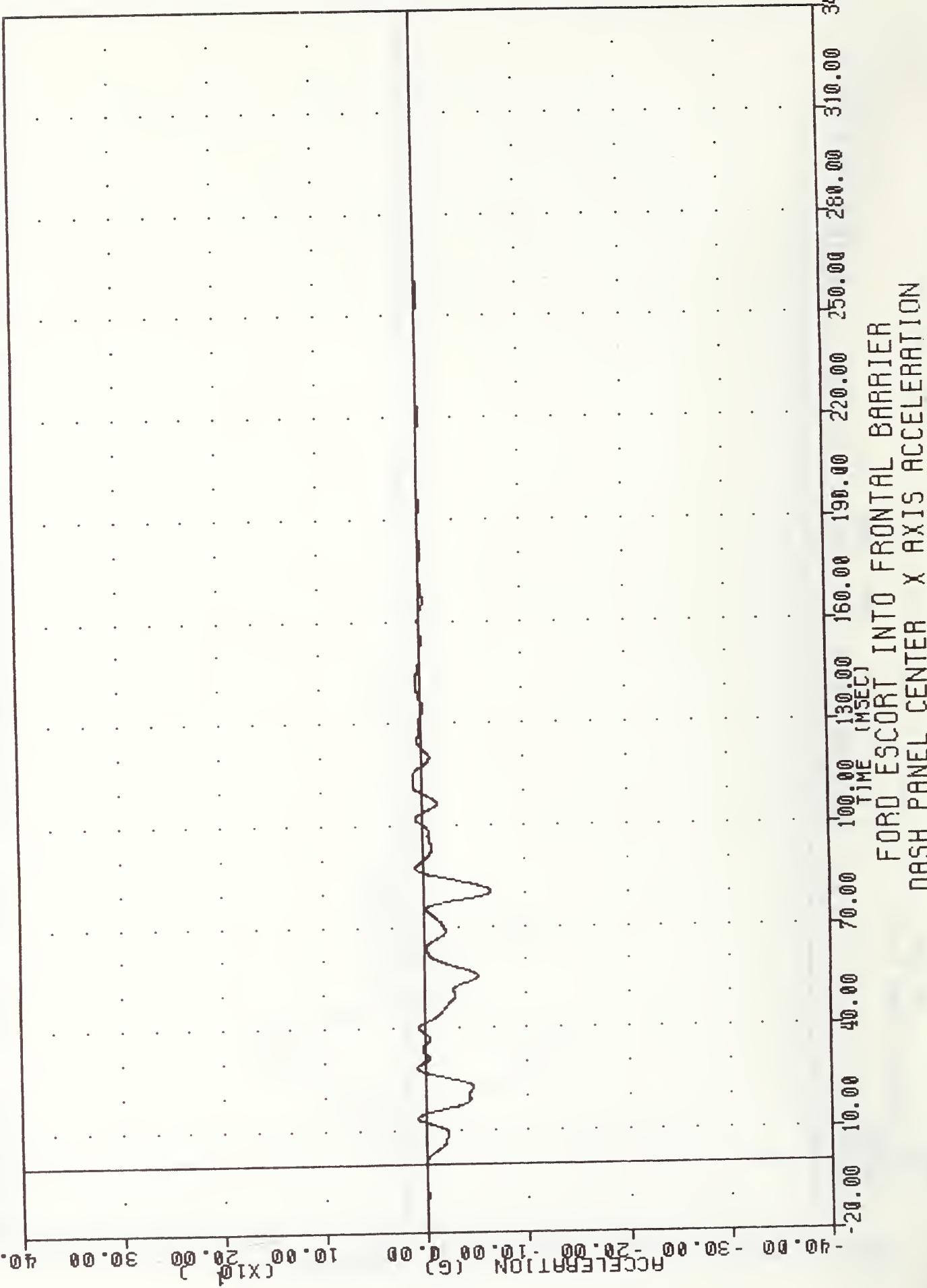
BCLXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -73.538 34.38 , 32.18 & 53.25



TRC 871216
200 FRONTAL CRASH TEST
87350
OPCXG1

FILTER = BLPP 100/ 2500/-16
MIN. MAX VALUES = -65.958 80.38 , 10.06 & 113.75



APPENDIX C

DUMMY CERTIFICATION INFORMATION

PRE-TEST CALIBRATION

S/N: 45

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

12-DEC-87

VRTC 45C27HD1

HY3 SH45 HEAD DROP CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.50 DEG. F
RELATIVE HUMIDITY	10% - 70%	39.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	258.69 G
PEAK LATERAL ACCELERATION	15 G MAX	-3.09 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middle

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

12-DEC-87

VRTC 45C27NE1 HY3 SN45 CAL27 NECK EXTENSION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.80 DEG. F
RELATIVE HUMIDITY	10% - 70%	37.00 %
IMPACT VELOCITY	19.50 - 20.30 FPS	19.57 FPS
PENDULUM	10 MS 17.20 - 21.20 G	20.20 G
DECELERATION	20 MS 14.00 - 19.00 G	17.09 G
	30 MS 11.00 - 16.00 G	13.73 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	13.67 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	38.00 MS
IN PLANE	MAX 81 - 106 DEG.	102.38 DEG.
ROTATION	TIME 72 - 82 MS	82.00 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LB	-53.75 FT.LBS
CONDYLE	TIME 65 - 79 MS	74.00 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	165.63 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	141.00 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN,

Chas. Middlekauf

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

12-DEC-87

CHRYSLER 45C27NF1 HY3 SN45 CAL27 NECK FLEXION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	70.20 DEG. F
IRELATIVE HUMIDITY	10% - 70%	37.00 %
IIMPACT VELOCITY	22.6 - 23.4 FPS	23.17 FPS
PENDULUM	10 MS 22.50 - 27.50 G	24.38 G
DECELERATION	20 MS 17.60 - 22.60 G	20.11 G
	30 MS 12.50 - 18.50 G	16.77 G
IMAX PENDULUM G ABOVE 30 MS	29 G MAX	16.72 G
IDECCELERATION-TIME CURVE		
IDECAY TIME TO 5 G	34 - 42 MS	38.50 MS
R PLANE	MAX 64 - 78 DEG.	76.19 DEG.
ROTATION	TIME 57 - 64 MS	64.00 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	73.47 FT.LBS
CONDYLE	TIME 47 - 58 MS	53.25 MS
IROTATION ANGLE-TIME CURVE		
IDECAY TIME TO ZERO	113 - 128 MS	123.88 MS
IPOSITIVE MOMENT-TIME CURVE		
IDECAY TIME TO ZERO	97 - 107 MS	104.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middlek

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

14-DEC-87

VRTC 45C27TH1

HY3 SN45 CAL 27 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST		TEST RESULTS
	SPECIFICATION		
TEMPERATURE	69 - 72 DEG. F		70.40 DEG. F
RELATIVE HUMIDITY	10% - 70%		31.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC		21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES		2.83 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS		1211.6 POUNDS
INTERNAL HYSTERESIS	69% - 85%		74.8%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleit

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

12-DEC-87

LEFT KNEE
VRTC 45027LK1

HY3 SR45 L.KNEE 11LB CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	71.40 DEG. F
IRELATIVE HUMIDITY	10% - 70%	38.00 %
IPROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
YPEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1397.04 LBS.
IPROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleット

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

12-DEC-87

RIGHT KNEE
VRTC 45C27RK1

HY3 SN45 R.KNEE 11LB CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.40 DEG. F
RELATIVE HUMIDITY	10% - 70%	38.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1362.14 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlek

PRE-TEST CALIBRATION

S/N: 143

HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 143
A	Sitting Height (Erect)	34.8 ± .2	<u>34.7</u>
B	Shoulder Pivot Height	20.2 ± .3	<u>20.2</u>
C	"H" Point Height	3.4 ref.	<u>3.4</u>
D	"H" Point Location from Back Line	5.4 ref.	<u>5.4</u>
E	Shoulder Pivot Location from Back Line	3.5 ± .2	<u>3.5</u>
F	Thigh Clearance	5.8 ± .3	<u>5.8</u>
G	Back of Elbow to Wrist Pivot	11.7 ± .3	<u>11.5</u>
H	Occiput to Z-Axis	1.7 ± .1	<u>1.7</u>
I	Shoulder - Elbow Length	13.3 ± .3	<u>13.0</u>
J	Elbow Rest Height	7.9 ± .4	<u>8.2</u>
K	Buttock Knee Length	23.3 ± .5	<u>22.9</u>
L	Popliteal Height	17.4 ± .5	<u>17.2</u>
M	Knee Pivot Height	19.4 ± .3	<u>19.2</u>
N	Buttock Popliteal Length	18.3 ± .5	<u>18.6</u>
O	Chest Depth	8.7 ± .3	<u>8.8</u>
P	Foot Length	10.2 ± .3	<u>10.1</u>
V	Shoulder Breadth	16.9 ± .3	<u>16.7</u>
W	Foot Breadth	3.9 ± .3	<u>3.7</u>
Y	Chest Circumference	38.8 ± .6	<u>38.4</u>
Z	Waist Circumference	33.5 ± .6	<u>33.8</u>
AA	Location for Measurement of Chest Circumference	17.0 ± .1	<u>17.0</u>
BB	Location for Measurement of Waist Circumference	9.0 ± .1	<u>9.0</u>

NOTE: The "H" point is located 1.83 inches forward and 2.57
inches down from the center of the pelvis angle reference hole.

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

01-DEC-87

VRTC 143C3HD1

HY3 SN143 HEAD DROP CAL 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
IRELATIVE HUMIDITY	10% - 70%	26.00 %
IPEAK RESULTANT ACCELERATION	225 - 275 G	254.31 G
IPEAK LATERAL ACCELERATION	15 G MAX	-4.57 G
IIS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

02-DEC-87

VRTC 143C3NE1 HY3 SN143 CAL3 NECK EXTENSION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	71.20 DEG. F
RELATIVE HUMIDITY	10% - 70%	27.00 %
IMPACT VELOCITY	19.50 - 20.30 FPS	19.60 FPS
PENDULUM	10 MS 17.20 - 21.20 G 20.30 G	
DECELERATION	20 MS 14.00 - 19.00 G 15.44 G	
	30 MS 11.00 - 16.00 G 13.95 G	
MAX PENDULUM G ABOVE 30 MS	22 G MAX	13.91 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	38.63 MS
D PLANE	MAX 81 - 106 DEG.	102.34 DEG.
ROTATION	TIME 72 - 82 MS	80.25 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LB	-57.61 FT.LBS
CONDYLE	TIME 65 - 79 MS	74.88 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	165.25 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	146.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN *Chas. Middleb*

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

02-DEC-87

VRTC 143C3NF1 HY3 SN143 CAL3 NECK FLEXION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	71.70 DEG. F
IRELATIVE HUMIDITY	10% - 70%	28.00 %
IMPACT VELOCITY	22.6 - 23.4 FPS	23.11 FPS
PENDULUM	10 MS 22.50 - 27.50 G	25.51 G
DECELERATION	20 MS 17.60 - 22.60 G	20.70 G
	30 MS 12.50 - 18.50 G	16.27 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	16.17 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	34 - 42 MS	36.50 MS
D PLANE	MAX 64 - 78 DEG.	76.79 DEG.
ROTATION	TIME 57 - 64 MS	58.75 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	73.55 FT.LBS
CONDYLE	TIME 47 - 58 MS	52.88 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	113 - 128 MS	120.13 MS
POSITIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	97 - 107 MS	104.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN

Char. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

02-DEC-87

VRTC 143C3TH1

HY3 SN143 CAL 3 H.S. THORAX 01

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.80 DEG. F
RELATIVE HUMIDITY	10% - 70%	26.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.81 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1227.0 POUNDS
INTERNAL HYSTERESIS	69% - 85%	73.3%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleb

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

01-DEC-87

LEFT KNEE
VRTC 143C3LK1

HY3 SN143 L,KNEE 11LB CAL 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	71.60 DEG. F
IRELATIVE HUMIRITY	10% - 70%	26.00 %
IPROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
IPeAK KNEE IMPACT FORCE	996 - 1566 LBS.	1159.47 LBS.
IPROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleit

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

01-DEC-87

RIGHT KNEE
VRTC 143C3RK1

HY3 SN143 R.KNEE 11LB CAL. 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
IRELATIVE HUMIRITY	10% - 70%	26.00 %
IPROBE VELOCITY	6.8 - 7.0 FT/SEC	6.91 FT/SEC
IPeAK KNEE IMPACT FORCE	996 - 1566 LBS.	1139.25 LBS.
IPROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

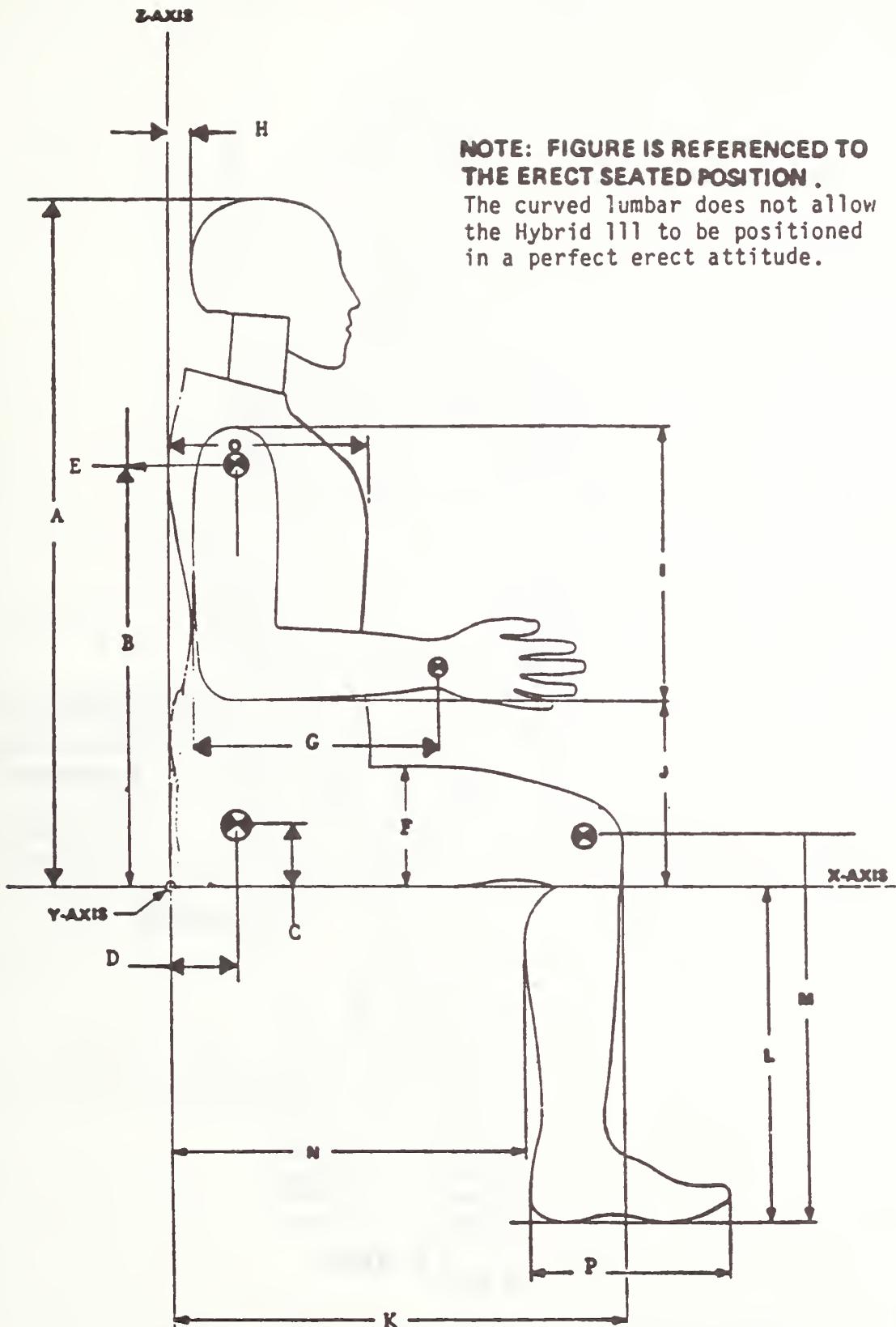
POST-TEST CALIBRATION

S/N: 45

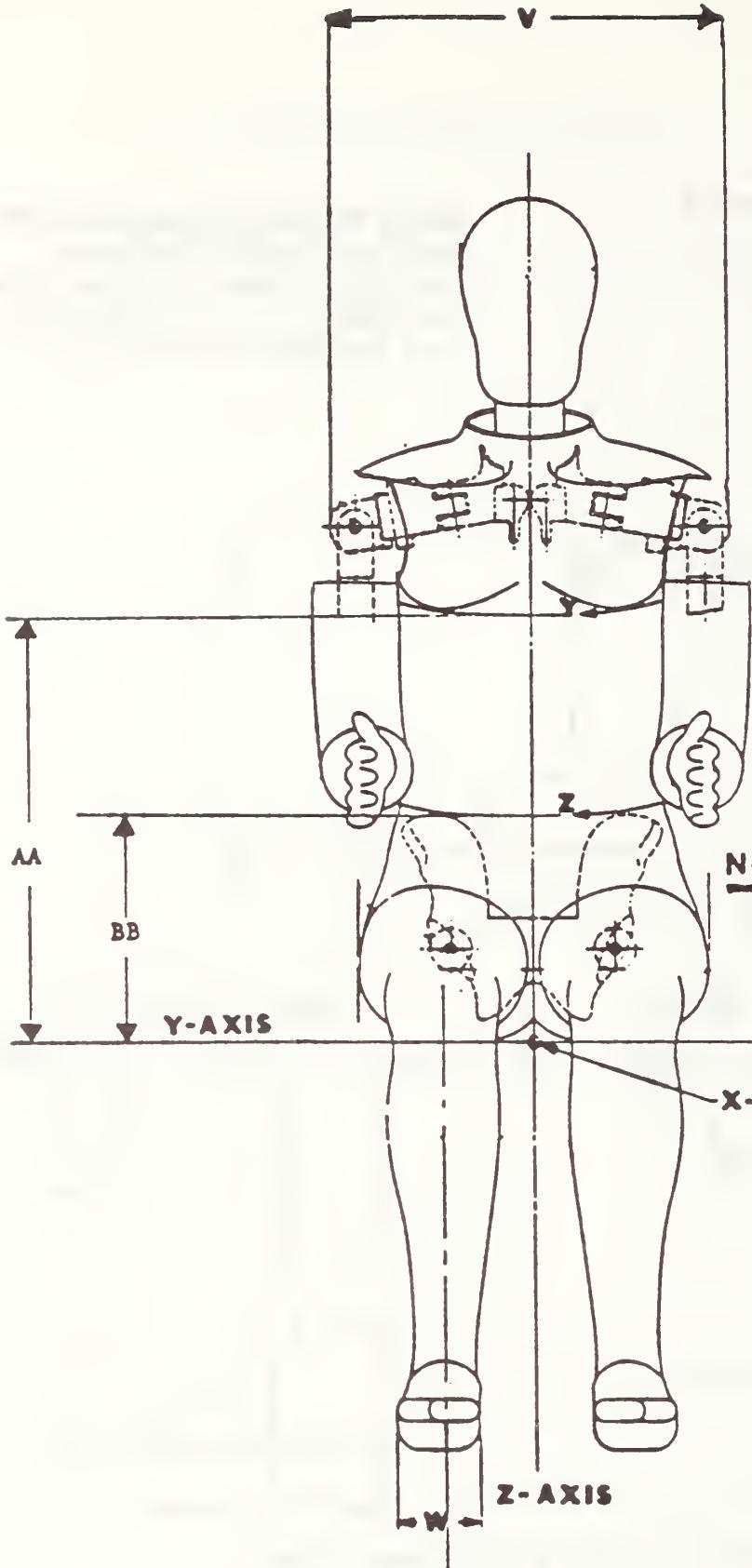
HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension <u>SN 45</u>
A	Sitting Height (Erect)	34.8 ± .2	<u>34.6</u>
B	Shoulder Pivot Height	20.2 ± .3	<u>20.0</u>
C	"H" Point Height	3.4 ref.	<u>3.4</u>
D	"H" Point Location from Back Line	5.4 ref.	<u>5.4</u>
E	Shoulder Pivot Location from Back Line	3.5 ± .2	<u>3.7</u>
F	Thigh Clearance	5.8 ± .3	<u>5.8</u>
G	Back of Elbow to Wrist Pivot	11.7 ± .3	<u>11.5</u>
H	Occiput to Z-Axis	1.7 ± .1	<u>1.7</u>
I	Shoulder - Elbow Length	13.3 ± .3	<u>13.6</u>
J	Elbow Rest Height	7.9 ± .4	<u>7.9</u>
K	Buttock Knee Length	23.3 ± .5	<u>23.0</u>
L	Popliteal Height	17.4 ± .5	<u>17.5</u>
M	Knee Pivot Height	19.4 ± .3	<u>19.5</u>
N	Buttock Popliteal Length	18.3 ± .5	<u>17.9</u>
O	Chest Depth	8.7 ± .3	<u>8.6</u>
P	Foot Length	10.2 ± .3	<u>10.2</u>
V	Shoulder Breadth	16.9 ± .3	<u>16.8</u>
W	Foot Breadth	3.9 ± .3	<u>3.9</u>
Y	Chest Circumference	38.8 ± .6	<u>38.8</u>
Z	Waist Circumference	33.5 ± .6	<u>33.6</u>
AA	Location for Measurement of Chest Circumference	17.0 ± .1	<u>17.0</u>
BB	Location for Measurement of Waist Circumference	9.0 ± .1	<u>9.0</u>

NOTE: The "H" point is located 1.83 inches forward and 2.57 inches down from the center of the pelvis angle reference hole.



HYBRID III Exterior Body Dimensions - Side View



**NOTE: FIGURE REFERENCED
TO THE ERECT SEATED
POSITION .**

The curved lumbar does
not allow the Hybrid III
to be positioned in a
perfect erect attitude.

HYBRID III Exterior Body Dimensions - Front View

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

07-Jan-88

VRTC

45C28HD1

HY3 SN45 HEAD DROP CAL28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	70.10 DEG. F
IRELATIVE HUMIDITY	10% - 70%	13.00 %
IPEAK RESULTANT ACCELERATION	225 - 275 G	250.64 G
IPEAK LATERAL ACCELERATION	15 G MAX	-2.22 G
IIS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN DmMouy

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

09-Jan-88

VRTC 45C28NE1

HY3 SN45 CAL28 NECK EXTENSION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	71.80 DEG. F
IRELATIVE HUMIDITY	10% - 70%	14.00 %
IMPACT VELOCITY	19.50 - 20.30 FPS	19.99 FPS
PENDULUM	10 MS 17.20 - 21.20 G	18.47 G
DECELERATION	20 MS 14.00 - 19.00 G	16.21 G
	30 MS 11.00 - 16.00 G	11.11 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	11.30 G
DECCELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	43.38 MS
D PLANE	MAX 81 - 106 DEG.	99.12 DEG.
ROTATION	TIME 72 - 82 MS	81.75 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LB	-52.42 FT.LBS
CONDYLE	TIME 65 - 79 MS	75.63 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	169.88 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	143.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN John Morris

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

08-Jan-88

VRTC 45C28NF1

HY3 SN45 CAL28 NECK FLEXION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	16.00 %
IMPACT VELOCITY	22.6 - 23.4 FPS	22.86 FPS
PENDULUM	10 MS 22.50 - 27.50 G 25.97 G	
DECELERATION	20 MS 17.60 - 22.60 G 19.72 G	
	30 MS 12.50 - 18.50 G 16.20 G	
MAX PENDULUM G ABOVE 30 MS	29 G MAX	16.10 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	34 - 42 MS	37.63 MS
D PLANE	MAX 64 - 78 DEG.	75.46 DEG.
ROTATION	TIME 57 - 64 MS	62.38 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	71.55 FT.LBS
CONDYLE	TIME 47 - 58 MS	52.13 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	113 - 128 MS	125.75 MS
POSITIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	97 - 107 MS	104.63 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Tom May

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

09-Jan-88

VRTC 45C28TH1

HY3 SN45 CAL 28 H.S.THRAX 01

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	70.80 DEG. F
RELATIVE HUMIDITY	10% - 70%	14.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.62 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.79 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1204.7 POUNDS
INTERNAL HYSTERESIS	69% - 85%	73.9%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Dra. May

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

07-Jan-88

LEFT KNEE
VRTC 4502BLK1

HY3 SN45 L.KNEE 11L.B CAL28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	69.60 DEG. F
IRELATIVE HUMIDITY	10% - 70%	13.00 %
I PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.87 FT/SEC
IPeAK KNEE IMPACT FORCE	996 - 1566 LBS.	1381.69 LBS.
I PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Tom May

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

07-Jan-88

RIGHT KNEE
VRTC 45028RK1

HY3 SN45 R.KNEE 11LB CAL28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	69.90 DEG. F
RELATIVE HUMIDITY	10% - 70%	13.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1432.22 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN DmMouy

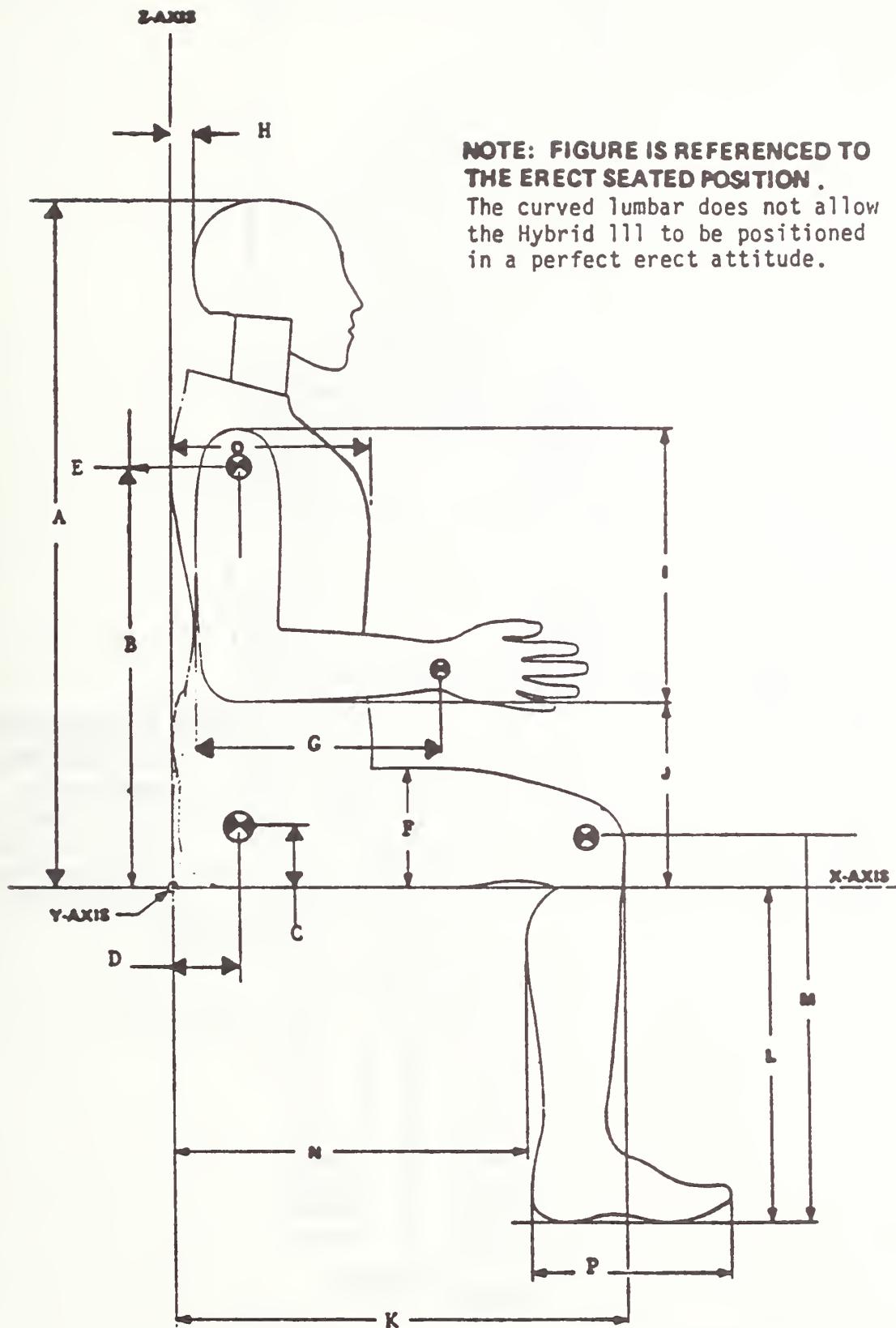
POST-TEST CALIBRATION

S/N: 143

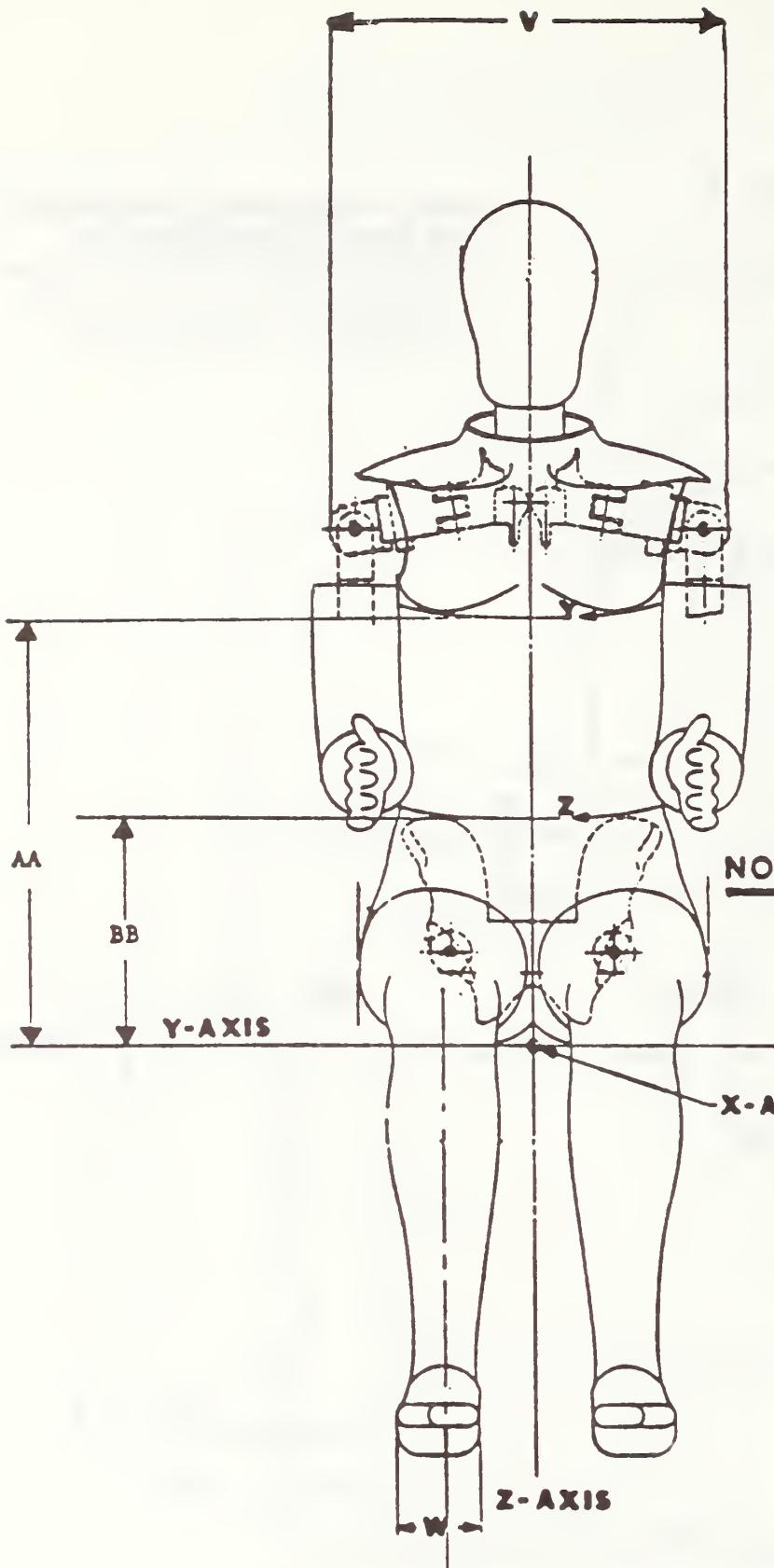
HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 143
A	Sitting Height (Erect)	34.8 ± .2	34.7
B	Shoulder Pivot Height	20.2 ± .3	20.0
C	"H" Point Height	3.4 ref.	3.4
D	"H" Point Location from Back Line	5 ref.	5.4
E	Shoulder Pivot Location from Back Line	3.5 ± .2	3.7
F	Thigh Clearance	5.8 ± .3	5.9
G	Back of Elbow to Wrist Pivot	11.7 ± .3	11.6
H	Occiput to Z-Axis	1.7 ± .1	1.7
I	Shoulder - Elbow Length	13.3 ± .3	13.2
J	Elbow Rest Height	7.9 ± .4	8.1
K	Buttock Knee Length	23.3 ± .5	23.0
L	Popliteal Height	17.4 ± .5	17.4
M	Knee Pivot Height	19.4 ± .3	19.5
N	Buttock Popliteal Length	18.3 ± .5	18.0
O	Chest Depth	8.7 ± .3	8.7
P	Foot Length	10.2 ± .3	10.2
V	Shoulder Breadth	16.9 ± .3	16.8
W	Foot Breadth	3.9 ± .3	4.0
Y	Chest Circumference	38.8 ± .6	38.9
Z	Waist Circumference	33.5 ± .6	33.8
AA	Location for Measurement of Chest Circumference	17.0 ± .1	17.0
BB	Location for Measurement of Waist Circumference	9.0 ± .1	9.0

NOTE: The "H" point is located 1.83 inches forward and 2.57 down
down from the center of the pelvis angle reference hole.



HYBRID III Exterior Body Dimensions - Side View



**NOTE: FIGURE REFERENCED
TO THE ERECT SEATED
POSITION.**

The curved lumbar does
not allow the Hybrid III
to be positioned in a
perfect erect attitude.

HYBRID III Exterior Body Dimensions - Front View

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

06-Jan-88

VRTC 143C4HD1 HY3 SN143 HEAD DROP CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
IRELATIVE HUMIDITY	10% - 70%	15.00 %
IPEAK RESULTANT ACCELERATION	225 - 275 G	250.53 G
IPEAK LATERAL ACCELERATION	15 G MAX	-3.05 G
IIS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Tom May

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

08-Jan-88

VRTC

143C4NE1

HY3 SN143 CAL4 NECK EXTENSION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	71.60 DEG. F
IRELATIVE HUMIDITY	10% - 70%	16.00 %
IMPACT VELOCITY	19.50 - 20.30 FPS	19.51 FPS
PENDULUM	10 MS 17.20 - 21.20 G	19.87 G
DECELERATION	20 MS 14.00 - 19.00 G	16.07 G
	30 MS 11.00 - 16.00 G	12.30 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	12.20 G
DECELERATION-TIME CURVE		
DECAY TIME TO 5 G	38 - 46 MS	42.25 MS
D PLANE	MAX 81 - 106 DEG.	111.37 DEG. **
ROTATION	TIME 72 - 82 MS	75.75 MS
MOMENT ABOUT OCCIPITAL	MIN -59.0/-39.0 FT.LB	-52.40 FT.LBS
CONDYLE	TIME 65 - 79 MS	75.00 MS
ROTATION ANGLE-TIME CURVE		
DECAY TIME TO ZERO	147 - 174 MS	171.38 MS
NEGATIVE MOMENT-TIME CURVE		
DECAY TIME TO ZERO	120 - 148 MS	160.50 MS **

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Don May

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER

07-Jan-88

VRTC 143C4NF1

HY3 SN143 CAL4 NECK FLEXION

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	69 - 72 DEG. F	70.60 DEG. F
IRELATIVE HUMIDITY	10% - 70%	12.00 %
IIMPACT VELOCITY	22.6 - 23.4 FPS	23.00 FPS
PENDULUM	10 MS 22.50 - 27.50 G 28.84 G **	
DECELERATION	20 MS 17.60 - 22.60 G 20.72 G	
	30 MS 12.50 - 18.50 G 16.78 G	
IMAX PENDULUM G ABOVE 30 MS	29 G MAX	16.66 G
IDECCELERATION-TIME CURVE		
IDECAY TIME TO 5 G	34 - 42 MS	34.88 MS
D PLANE	MAX 64 - 78 DEG.	79.62 DEG.**
ROTATION	TIME 57 - 64 MS	61.38 MS
MOMENT ABOUT OCCIPITAL	MAX 65 - 80 FT.LBS	65.60 FT.LBS
CONDYLE	TIME 47 - 58 MS	55.75 MS
ROTATION ANGLE-TIME CURVE		
IDECAY TIME TO ZERO	113 - 128 MS	122.50 MS
IPOSITIVE MOMENT-TIME CURVE		
IDECAY TIME TO ZERO	97 - 107 MS	102.50 MS

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN *John May*

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III

09-Jan-88

VRTC 143C4TH1 HY3 SN143 CAL 04 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	69 - 72 DEG. F	70.80 DEG. F
RELATIVE HUMIDITY	10% - 70%	14.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.87 INCHES *
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1233.2 POUNDS
INTERNAL HYSTERESIS	69% - 85%	72.2%

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Tom May

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

07-Jan-88

LEFT KNEE
VRTC 143C4LK1

HY3 SN143 L.KNEE 11LB CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
ITEMPERATURE	66 - 78 DEG. F	70.60 DEG. F
IRELATIVE HUMIDITY	10% - 70%	13.00 %
IPROBE VELOCITY	6.8 - 7.0 FT/SEC	6.95 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1329.89 LBS.
IPROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III

07-Jan-88

RIGHT KNEE
VRTC 14304RK1

HY3 SN143 R.KNEE 11LB CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.50 DEG. F
RELATIVE HUMIDITY	10% - 70%	13.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1298.57 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Tom May

46 70°F
10 MM/M
12/16 13:00-

26 72°F
10 MM/M
12/16 11:00-

26 71°F
10 MM/M
12/16 09:00-

26 70°F
10 MM/M
12/16 03:00-

26 71°F
10 MM/M
12/16 16:00-

3 PAPER FEED (NO TIME)

2 PAPER FEED (NO TIME)

0 10 20 30 40 50 60 70 80 90

0 10 20 30 40 50 60 70 80 90

0.075 0.1 0.15 0.20



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